ERIC Document Resume | **See Instruction Sheet** | DATE OF RESUME 6/24/65 | DATE RECEIVED

A. PUBLICATION DATA

ED001266

2. ORIGINATOR CONTROL NO(S).
NA

3. IDENTIFICATION NO.
CR 1869

DO NOT WRITE IN SPACE BELOW

MICROFILM COPY AVAILABLE
YES ☒ NO ☐

COPYRIGHT GRANTED
YES ☐ NO ☒

COPYRIGHT RELEASE FILED
YES ☐ NO ☒

TYPE OF REPORT
PROPOSAL ☐
IN-PROGRESS ☐
FINAL ☒
FOLLOW-UP ☐

OTHER ERIC REFERENCES:

ERIC SATELLITE CODE

4. AUTHOR(S):
Reid, Hale C. and Hieronymus, A.N.

5. TITLE OF DOCUMENT ABSTRACTED:
An Evaluation of Five Methods of Teaching Spelling in the Second and Third Grades

6. PUBLICATION TITLE:
N.A.

7. EDITOR(S):
N.A.

8. PLACE OF ORIGIN
ORG. State Univ. of
ST. Iowa
CITY, STATE Iowa City, Iowa
TELE. EXT.
INST/LOC CODE

9. PUBLISHER OR SOURCE
Cooperative Research Project, Office of Edu., Dept. of HEW - Washington, D.C.

10. VOL.	11. PAGES	12. MO./YR.	13. TOTAL PP.
N.A.	N.A.	63	111

B. INDEXING DATA

14. SUBJECT AREA

15. TYPE OF ENDEAVOR
Research

16. INDEXING TERMS (6-12)

		Teaching methods		
Criterion tests	Spelling	Testing		
Elementary level	Spelling skills	Word perception skills		
Pupil intelligence	Teacher quality			

17. ABSTRACT (MAX. 250 WORDS)

The relative effectiveness of five methods for improving the spelling ability of pupils in Grades 2 and 3 was determined. Assignments of teachers and classrooms to method was based upon teacher preference for method, estimated average achievement level of pupils in each classroom, and ratings of teacher quality. At the beginning of the study a group intelligence test was given to evaluate the interaction of methods and ability levels. Two pre-experiment spelling tests, one based on the basal word lists for the year and one based on words not taught directly, were also administered. At the close of the study three final criterion tests were employed, the two pre-experiment tests were re-administered, and a sensitivity-to-error test in a proofreading situation was given.

The five methods used were entitled Test-Study-Test, Word Perception With Test, Word Perception Without Test, Correction and Proofreading, and Workbook. Description of the data collected and the analyses of data are included.

Nothing in the results suggests a clear cut superiority of one method over all the others.

ERIC No.

18. SOURCE OF ABSTRACT

C. FUNDING DATA

19. SUPPORTING ORGANIZATION

20. DIVISION OR DEPT.

21. CONTRACT NO.

PROJECT NO.

22. TOTAL COST OF PROJECT

23. DURATION OR PROJECT

U.S. Department of Health, Education, and Welfare Office of Education

2

ERIC Form 1

REPRINTED BY PERMISSION
U. S. DEPARTMENT OF HEALTH, EDUCATION AND WELFARE
OFFICE OF EDUCATION

THIS DOCUMENT HAS BEEN PRINTED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

ED001266

AN EVALUATION OF FIVE METHODS
OF TEACHING SPELLING
IN THE SECOND AND THIRD GRADES

Cooperative Research Project No. 1869

HALE C. REID

A. N. HIERONYMUS

Cedar Rapids Community School District

State University of Iowa

AN EVALUATION OF FIVE METHODS OF TEACHING SPELLING IN THE SECOND AND THIRD GRADES

Cooperative Research Project No. 1869

Hale C. Reid
Cedar Rapids, Iowa Community School District

and

A.N. Hieronymus
State University of Iowa

1963

The research reported herein was supported by the Cooperative Research Program of the Office of Education, U.S. Department of Health, Education, and Welfare.

ACKNOWLEDGMENTS

This study was made possible through the cooperative effort of the Cedar Rapids Public Schools and the University of Iowa. The assistance and participation of the fifty second and third grade teachers in the Cedar Rapids schools is especially acknowledged.

Three Cedar Rapids school staff members contributed services which were indispensable for the completion of this study. Miss Helen Crane, Primary Grade Consultant, was especially helpful in organizing and conducting the in-service meetings with the fifty teachers; Mrs. Margaret Wittrig, Principal of Noelridge Elementary School, for accepting the responsibility of serving as the observer and supervisor of the instructional phase of the study; and Dr. Ira J. Semler, Director of Research, for the statistical analysis and valuable assistance in the preparation of the final report.

The counsel of Professors H.F. Spitzer, P.J. Blommers, and L.S. Feldt, of the State University of Iowa, Iowa City, Iowa, with respect to the formulation, design, and analysis of the project is gratefully acknowledged.

Appreciation is also expressed to Miss Diane DeLancey for her secretarial assistance and with the many details in the preparation of this report.

TABLE OF CONTENTS

ACKNOWLEDGMENTS.................................. 2

TABLE OF CONTENTS................................ 3

TABLE OF TABLES.................................. 5

THE PROBLEM...................................... 8

RELATED RESEARCH................................. 10

PROCEDURE.. 12
  Overview....................................... 12
  Assignment of Classes to Methods............... 12
    Teacher Preference for Method................ 12
    Teacher Quality Index........................ 13
  Estimated Average Achievement Level of Classes...... 14
  Criterion Measures............................. 14
    Horn-Ashbaugh Spelling Textbook Test (HASTT)..... 17
    New Iowa Spelling Scale Test (NISST)......... 17
    Sensitivity to Error Test (STET)............. 18
    Observation of and Teacher Reaction to Method.... 19
    Administration of Criterion Tests............ 19
    Pupil Intelligence........................... 20
    Statistical Design........................... 21
  Description of Methods......................... 22
    Method 1..................................... 22
    Methods 2 and 3.............................. 25
    Method 4..................................... 28
    Method 5..................................... 31
    Summary of Methods........................... 34
  Supervision and Control........................ 34
    Observation and Supervision.................. 34
    In-Service Meetings.......................... 35
    Report of Observations Made at the Second Series of In-Service Meetings.................. 37
    Report of Later Observations................. 41
    Teacher's Reaction to Control................ 42

ANALYSIS OF DATA AND RESULTS........................... 43
  Analysis of Objective Criterion Measures........... 43
    Reliability of the New Iowa Spelling Scale Test (NISST) and the Horn-Ashbaugh Spelling Textbook Test (HASTT)........................ 43
    Pre- and Post-Experiment Spelling Ability....... 44
    Relationships Among Major Variables............. 47
    Analysis of Method Effectiveness................ 47
    Analysis of Gain Scores for Grades 2 and 3...... 58
    Classroom Analyses.............................. 64
    Summary of Tests of All Possible Differences Among Methods.............................. 69
  Supervisor's Report on Teachers' Reactions to Methods 71
    Method No. 1 (Test-Study-Test).................. 71
    Method No. 2 (Word Perception With Test)........ 73
    Method No. 3 (Word Perception Without Test)..... 74
    Method No. 4 (Correction and Proofreading)...... 75
    Method No. 5 (Workbook)......................... 77

SUMMARY OF RESULTS AND CONCLUSIONS.................... 78

APPENDIX.. 83

TABLE OF TABLES

TABLE 1: Average and Range of Selected Teacher and Classroom Characteristics for Grade 2 After Assignment to Five Experimental Methods....... 15

TABLE 2: Average and Range of Selected Teacher and Classroom Characteristics for Grade 3 After Assignment to Five Experimental Methods....... 16

TABLE 3: Numbers, Means, and Standard Deviations of Lorge-Thorndike Intelligence Quotients by Method and Grade Level........................ 21

TABLE 4: Estimated Reliability Coefficients of the HASTT and NISST for Grades 2 and 3.................. 44

TABLE 5: Number, Mean, and Standard Deviation of Pre- and Post-Test Spelling Scores by Grade Level and Method...................................... 45

TABLE 6: Number, Mean, and Standard Deviation of Pre- and Post-Test Spelling Scores by Grade Level and Method...................................... 46

TABLE 7: Intercorrelations Among NISST and HASTT Pre- and Post-Tests, Lorge-Thorndike IQ and Teacher Quality Index for Grade 2............. 48

TABLE 8: Intercorrelations Among NISST and HASTT Pre- and Post-Tests, Lorge-Thorndike IQ and Teacher Quality Index for Grade 3............. 49

TABLE 9: Covariance Analysis of Grade 2 Post-NISST..... 51

TABLE 10: Covariance Analysis of Grade 2 Post-HASTT..... 52

TABLE 11: Covariance Analysis of Grade 3 Post-NISST..... 53

TABLE 12: Covariance Analysis of Grade 3 Post-HASTT..... 54

TABLE 13: Analysis of STET Grade 2...................... 56

TABLE 14: Analysis of STET Grade 3...................... 57

TABLE 15: Number and Mean IQ of Pupils by Grade Used for Proportional Method by IQ Level Gain Score Analysis................................ 59

TABLE 16: Analysis of Grade 2 NISST Gain Scores by IQ Level...................................... 60

TABLE 17: Analysis of Grade 2 HASTT Gain Scores by IQ Level...................................... 61

TABLE 18: Analysis of Grade 3 NISST Gain Scores by IQ Level...................................... 62

TABLE 19: Analysis of Grade 3 HASTT Gain Scores by IQ Level...................................... 63

TABLE 20: Classroom Analysis of Grade 2 Post-NISST...... 65

TABLE 21: Classroom Analysis of Grade 2 Post-HASTT...... 66

TABLE 22: Classroom Analysis of Grade 3 Post-NISST...... 67

TABLE 23: Classroom Analysis of Grade 3 Post-HASTT...... 68

TABLE 24: The Significance of the Simple Effects from All Analyses for Grades 2 and 3.......... 70

TABLE 25: Summary of Statistically Significant Comparisons.................................. 79

THE PROBLEM

In concluding the "needed research" section of his article on spelling in the 1950 Edition of The Encyclopedia of Educational Research, Horn wrote:

"The most needed type of research (in spelling)...is the investigation of the relative effectiveness of different complete patterns of instruction, each designed in the light of the best available evidence and consistently adhered to and tested in typical school systems over a period of several years." (p. 1260)

The present study was intended to implement this recommendation, except that the time was limited for purpose of the research contract to one year.

In spite of nearly a half century of systematic research on methods of teaching spelling, there is still considerable controversy over the relative emphasis which should be placed upon direct systematic instruction, and upon what might be termed a more functional incidental approach. The spelling of certain words in our language, particularly those which have irregular spellings, can probably best be learned through direct, systematic study. Phonetic understandings and generalizations are unquestionably based upon experiences in studying the spelling of specific words. On the other hand, the very large number of words used by adults in everyday writing cannot be taught in the limited time available for specific spelling instruction, but must be learned by more incidental means.

Most systems employ a compromise between extremes. In the Cedar Rapids schools, for example, the development of spelling skill is undertaken as a part of an integrated language arts program which involves the use of extensive written compositions beginning early in the first grade. This activity is one in which the pupil's independently written composition placed on the chalkboard serves as the source material for the correction of errors, including spelling errors, in content. This activity is referred to as "proofreading and correcting" and is employed in all first, second, and third grade classrooms. This approach to teaching spelling, although it occupies a minor portion of the total longuage experience, constitutes the common program in spelling in Grades 1, 2, and 3. However, in addition to this common program, a daily fifteen-minute period is devoted to the teaching of specific spelling skills.

The recommended program in primary grade spelling in the school system utilizes a basal word list. It applies the principles of word perception skills taught in reading in order to teach the child to learn additional words through (1) the substitution of one-, two-, and three-letter beginnings, (2) the substitution of medial vowel elements, (3) the addition of word endings with and without changes in the root form, and (4) the utilization of syllabic parts. Materials consist of a Spelling Guidebook for Grades 2 and 3 prepared by the Cedar Rapids Public Schools, 1962. This Spelling Guidebook consists of a series of lessons based on the weekly lessons presented in Spelling We Use, by Horn, Ashbaugh, Horn, Lippincott and Company, 1959. Every variation of the basic word presented in the lesson is contained in the guidebook. Consequently, a basal weekly list of fifteen words may be extended to a weekly list of some thirty to fifty words when the lesson is completed. See Appendix A for a sample lesson from the Spelling Guidebook.

The present investigation arose out of informal experimentation with a variety of methods which raised questions about the relative merits of various methods of teaching the basal word list and of teaching generalized spelling skills. Five different specific spelling methods involving various combinations of direct and incidental teaching were investigated.

Two of these methods (Test-Study-Test and Workbook) involved only direct teaching of a basal word list. Two of the methods (Word Perception With Test, and Word Perception Without Test) involved direct teaching of a basal word list, plus exercises intended to generalize spelling ability to other words. The other method, Proofreading and Correction, was a continuation of the correction and proofreading activity described above, and did not employ a basal word list.

The purpose of this study was to determine the relative effectiveness of these five methods in improving the spelling ability of pupils in Grades 2 and 3. The statistical hypotheses which were investigated are inherent in the design.

RELATED RESEARCH

In an extensive study of the effectiveness of a workbook approach as opposed to an "intensive" approach, Calhoun reported that the median growth under the workbook method was one year, while the intensive method produced progress of one year and four months. Calhoun stated than an intensive approach to spelling stressing understanding and appreciation of the goals and techniques of spelling instruction greatly aids pupils in increasing the effectiveness of their study of spelling.

Eight months was the average growth made in seven months under the typical method, and the intensive method produced the same amount of progress in two months.

Cook investigated two methods of teaching spelling using the same word list. The control group studied each word as a whole and the experimental group used a workbook which provided early phonetic and structural analysis and also frequent study of words in context. Cook found that while both groups spelled well, the mean score achieved on the final spelling tests showed significant differences in favor of the control group. This study also revealed that pupils with IQ's between 90 and 110 did better on the method used by control group. There was no difference for pupils below 90 IQ.

Gates investigation which compared the Study Test and the Test Study methods indicated generally: that the brightest classes made larger gains when using the Test-Study method; that in Grades two, three, and four the dullest children made greater gains when taught by the Study-Test method; and that larger gains were produced by the Study-Test procedure in Grade 2 and low Grade 3. Gates findings favored the Test-Study plan because of its economy and efficiency in concentrating upon the words of difficulty for the individual but indicated that its main defect was in the deficiency of the method of study which might be due to poor supervision.

Horn investigated the effect of a corrected test upon learning to spell when the test is corrected by grade pupils under the direction of the teacher. Conclusions reached as a result of the investigation revealed the following:
1. The corrected test alone will contribute from 90 percent to 95 percent of the achievement resulting from the combined effect of the pronunciation exercise, corrected test, and

study. 2. In some classes the corrected test alone is sufficient for mastery or near mastery of the typical spelling lesson by the upper third of the class. 3. The corrected test appears to be the most important single factor contributing to achievement in spelling.

That the use of sentences as an element in method when combined with the use of lists gave better results than the use of lists alone, was reported by Zyve in an investigation trying the varied effects of several methods in teaching spelling. The investigation also revealed that four fifteen-minute periods a week for study on the new words, with the remaining fifteen-minute period for systematic review gave the same gain as did five fifteen-minute periods for study when two reviews of the words missed on the Riday test were included.

References

Calhoun, Robert T. "A Comparison of a Typical and an Intensive Method of Teaching Spelling." The Elementary School Journal 55: 154-157, November, 1954.

Cook, Ruth C. "Evaluation of Two Methods of Spelling" Elementary School Journal 58: 21-27, 1957-58.

Gates, Arthur I. "An Experimental Comparison of the Study Test and the Test Study Methods in Spelling." Journal of Educational Psychology 22: 1-19, January, 1931.

Horn, Thomas D. "The Effect of the Corrected Test on Learning to Spell." Elementary School Journal 47: 277-285, 1947.

Zyve, Claire. An Experimental Study of Methods, Contributions to Education, No. 466, Bureau of Publications, Teachers College, Columbia University, New York, 1931.

PROCEDURE

Overview

Five methods of teaching spelling employing five classrooms each were investigated in each of Grades 2 and 3. Assignments of teachers (and classrooms) to method was based upon teacher preference for method, estimated average achievement level of pupils in each classroom, and ratings of teacher quality. Near the beginning of the year a group intelligence test was administered in order to evaluate interaction of methods and ability levels. Also, two pre-experiment spelling tests were administered to all pupils, one based upon the basal word lists for the year, the other based upon words not taught directly. Adherence to prescribed method was closely supervised throughout the year.

Three final criterion tests were employed, the two pre-experimental spelling tests were re-administered, and a sensitivity to error test in a proofreading situation was administered.

The results were analyzed in three ways: 1) an analysis of final criterion measures by methods of analysis of covariance with teacher quality index, IQ's, and pretest scores serving as control variables; 2) a methods X IQ levels analysis of gain scores; and 3) a simple analysis of variance of criterion scores, using the classroom as the sampling unit.

Assignment of Classes to Methods

Three factors were taken into consideration in assigning classes to methods: teacher preference for method, teacher competence, and estimated general achievement level of class.

Teacher Preference for Method

In a group meeting of second and third grade teachers the nature of the experiment was presented and the methods described in some detail. Teachers were asked to submit in writing their first and second choices of method if asked to participate. In most instances teachers had a fairly strong preference for one method over the others. There also appeared to be some relationship between preference for method and length of service in the school system with newer and less experienced teachers tending to express preference for Methods 1 and 5 and the more experience with Methods 2,3, and 4.

It was possible to assign teachers to the method of first choice or second choice in 17 of the second grade classrooms and in 14 of the third grade classrooms. The additional assignments were made in consultation with the teacher, and in each case the teacher pledged her full cooperation.

Teacher Quality Index

In order to make certain that the various methods would be taught by teachers showing similar distributions of competence, a teacher rating scale was devised (See Appendix, page 88) and three separate and independent ratings were secured for each of the 149 teachers in Grades 2 and 3 in the system. One rating was secured from the appropriate building principal, one from the Director of Elementary Education, and one from the Consultant for Primary Education. New teachers were rated on the basis of credentials and "first impression". In some cases, one of the raters did not feel capable of making a rating. In these cases the average of the other two ratings was substituted for the missing rating. In a few cases, only a single rating was secured. In treating the ratings quantitatively, the raw ratings were converted to stanines using the following conversion table:

Raw Rating	Description	Stanine
1	Very superior; in upper 5%	9
2	Superior; in upper 10% but not in upper 5%	8
3	Excellent; in upper 25% but not in upper 10%	7
4	Very good; in upper 50% but not in upper 25%	6
5	Fair; in lower half but not in bottom quarter	4
6	Poor; in bottom quarter	2

The stanines for the three ratings were then totaled and a distribution for all teachers in Grades 2 and 3 secured. The totals were, in turn, converted to stanines.

While it was not possible to get identical distributions of teacher competence within method, the distributions were reasonably similar. Such differences as remained were adjusted in the statistical analysis.

Data on teacher training, age, total experience, and experience in the school system were also secured before assigning classes to method. In assigning to method the 50 teachers and 10 alternates from the 149 available for the study, these factors were also considered.

A summary of the distribution of teacher characteristics among methods is given in Tables 1 and 2.

Estimated Average Achievement Level of Classes

Because it was necessary to assign classes and teachers to methods before intelligence test scores or pre-experiment spelling scores could be secured, a substitute had to be found for insuring that the general level of academic aptitude would be similar for the five methods. Achievement in each of the twenty-seven buildings in the system remains reasonably constant in a relative sense from year to year since each building serves an area of relatively stable cultural and socio-economic characteristics. Within each building, children are assigned to classes to produce a predetermined and somewhat restricted range of reading ability. Therefore, it was possible to use average composite achievement (Iowa Tests of Basic Skills) for the previous two years in Grade 3 as a basis for estimating the average achievement level of each classroom in the experiment. These were estimated in terms of grade-equivalents. Tables 1 and 2 indicate the extent to which the general level and range of achievement was balanced among the methods. It was not crucial that these be exactly equated because of the employment of initial spelling ability as a control variable and of the employment of IQ as the "levels" variable in the analysis of gains.

Criterion Measures

In order to try to evaluate different outcomes of the spelling program, it was necessary to collect different types of evidence, both objective and subjective.

Three spelling tests were constructed for each grade. The first was a measure of the ability to spell a sample of words which were specifically studied during the year in four of the methods. The second was a measure of the ability to spell words of relatively high social utility which were not to be taught as a part of any of the methods. Both of these tests were list-dictation tests. The third test was a proofreading type of test which was designed to determine the extent to which pupils were sensitive to spelling error in printed materials.

In addition to test evidence, opinions of the project supervisor, and of teachers were solicited in a systematic manner.

Table 1

AVERAGE AND RANGE OF SELECTED TEACHER AND CLASSROOM CHARACTERISTICS FOR GRADE 2 AFTER ASSIGNMENT TO FIVE EXPERIMENTAL METHODS

Grade 2

	Method 1 T-S-T	Method 2 WPWT	Method 3 WPWOT	Method 4 C & P	Method 5 WB
No. of Classrooms	5	5	5	5	5
Predicted ITBS					
Mean (GE)	3.42	3.54	3.58	3.46	3.58
Range	3.2-3.9	3.2-3.9	3.1-4.0	3.4-3.5	3.2-4.2
Teacher Quality Index					
Mean (Stanine)	4.4	5.4	6.2	5.8	6.6
Range	3-6	3-8	2-8	2-8	5-9
Total Experience					
Mean (Years)	11.7	18.3	16.3	9.3	7.1
Range	1-35	2-42	5-38	1-36	1-15
Experience in System					
Mean (Years)	7.3	7.9	19.1	3.9	5.3
Range	1-23	1-29	5-34	0-17	1-12
Age					
Mean (Years)	37.4	42.8	48.0	33.4	30.0
Range	23-56	24-61	27-65	23-58	22-37

Table 2

AVERAGE AND RANGE OF SELECTED TEACHER AND CLASSROOM CHARACTERISTICS FOR GRADE 3 AFTER ASSIGNMENT TO FIVE EXPERIMENTAL METHODS

Grade 3

	Method 1 T-S-T	Method 2 WPWT	Method 3 WPWOT	Method 4 C & P	Method 5 WB
No. of Classrooms	5	5	5	5	5
Predicted ITBS					
Mean (GE)	3.24	3.54	3.58	3.46	3.50
Range	3.0-3.8	3.3-3.8	3.2-3.8	2.9-3.9	3.2-3.8
Teacher Quality Index					
Mean (Stanine)	5.0	5.0	5.6	5.9	5.1
Range	2-7	4-6	4-7	2-9	4-6
Total Experience					
Mean (Years)	3.8	4.8	11.7	9.8	2.7
Range	1-8	1-12	1-25	0-17	1-5
Experience in System					
Mean (Years)	2.8	3.2	6.9	5.0	1.9
Range	1-6	1-10	1-15	1-15	1-3
Age					
Mean (Years)	36.2	37.0	33.6	35.6	26.2
Range	24-45	25-61	22-52	22-59	24-29

Horn-Ashbaugh Spelling Textbook Test (HASTT)

These tests (administered as both pre-tests and post-tests) were used to determine the extent to which children could spell the words specifically taught during the year from the basal word lists. They consisted of 60 words in Grade 2 and 60 words in Grade 3 sampled from the Horn-Ashbaugh spelling textbook and workbook.

The words were selected primarily upon the basis of difficulty. In order to avoid as much as possible a ceiling effect on the end-of-year administration of the tests, words were selected which had correctness-of-response percents of less than 50 on the New Iowa Spelling Scale.

The 60-item test was broken down into three tests of 20 words each in Grade 2, and into two tests of 30 words each in Test 3 to avoid pupil fatigue and to secure reliability estimates which took account of day-to-day variations. The "equivalent" forms were assembled by arranging the words in order of difficulty and systematically assigning words to forms. The make-up of the tests was as shown below: The "percent of correct responses" are taken from the New Iowa Spelling Scale.

Percent of Correct Responses	Test	Grade 2			Grade 3	
		I	II	III	I	II
40-49		3	4	4	6	6
30-39		7	6	7	9	10
20-29		5	5	4	8	7
10-19		5	5	5	7	7
Totals		20	20	20	30	30

New Iowa Spelling Scale Test (NISST)

These tests (also administered as both pre-tests and post-tests) were used to determined the extent to which children could apply generalized spelling skills to the spelling of words not specifically taught, i.e., to measure the "transfer" outcomes of method. As with the HASTT, three subtests of 20 words each were administered in Grade 2 and two subtests of 30 words each were administered in Grade 3.

The words were selected from the New Iowa Spelling Scale as words with reasonably high social utility which were not a part of the formal spelling word lists of the grade or of previous grades. The words were selected to make the tests even more difficult than was the case with the HASTT. The make-up of the tests is shown below.

Percent of Correct Responses		Grade 2			Grade 3	
	Test	IV	V	VI	III	IV
30-34		--	--	--	3	3
25-29		--	--	--	6	7
20-24		--	--	--	6	6
15-19		1	2	2	8	8
10-14		7	6	6	4	4
5-9		6	7	7	2	1
0-4		6	5	5	1	1
Totals		20	20	20	30	30

Sensitivity to Error Test (STET)

The sensitivity to error test was administered as a post-test only. It was intended to evaluate the extent to which the different methods contribute to awareness of errors as they occur in a pupil's own writing or in the writing of others. It is a common observation that many pupils spell with a high degree of accuracy during the spelling period but spell less accurately in other writing activities; possibly because of attitude, possible because they have not been taught to recognize errors when they see them.

The tests were assembled by first selecting twenty words at each grade level from the basal word list and another twenty untaught words. Then a passage was written at each grade level to include twenty of the forty words in each list. Fifteen of these words were misspelled in context and five were spelled correctly. The score was the total number of the twenty words which were correctly identified as misspelled or, in the case of the correctly spelled words, passed as correct.

The percent of correct responses for the two tests (New Iowa Spelling Scale) are shown below:

Percent of Correct Responses	Grade 2	Grade 3
50-59	--	1
40-49	--	--
30-39	--	3
20-29	1	3
10-19	11	10
0-9	8	3
Total	20	20

Observation of and Teacher Reaction to Method

An experienced instructional supervisor of the research was employed to visit classrooms, observe difficulties in applying method, subjectively judge strong and weak points in each method, and to solicit teacher reactions to method. These activities will be reported in a later section.

Administration of Criterion Tests

As has been indicated previously, the two main criterion tests (HASTT and NISST) were administered as both pre-tests and post-tests, and were assembled as three equivalent forms each in Grade 2 and as two equivalent forms each in Grade 3. All were administered by the respective building principals. The pre-tests were administered between September 26, and October 5, 1962, and the post-tests were administered between May 6, and May 17, 1963.

To counter-balance fatigue effects, the order of administration of the tests was systematically varied. The sequence of administration in classes within methods was as follows:

	Grade 2						Grade 3			
Class 1	IV	I	V	II	VI	III	III	I	IV	II
Class 2	III	IV	I	V	II	VI	II	III	I	IV
Class 3	VI	III	IV	I	V	II	IV	II	III	I
Class 4	II	VI	III	IV	I	V	I	IV	II	III
Class 5	V	II	VI	III	IV	I	IV	II	III	I
Alternate	I	V	II	VI	II	IV	I	IV	II	III

Pupil Intelligence

The Lorge-Thorndike Intelligence Tests, Level 2, were administered during the second week of the 1962-63 academic year in order to obtain intelligence estimates of the children used in this experiment for use in investigating methods by IQ level interaction. The tests were administered by the classroom teachers. Prior to administering the tests, an in-service meeting was held to give instructions for administering the tests under controlled conditions. Scoring was done by the research project secretary at a central location. Table 3 presents the numbers, means, and standard deviations of Lorge-Thorndike Intelligence Quotients by method and grade level. The similarity of means and standard deviations indicates that the pupil samples for each method were very similar in general academic aptitude. These average IQ's are very similar to the average IQ of 109 found in an unpublished study of a large representative sample of Grade 5 pupils for the state as a whole on the Lorge-Thorndike Verbal Battery.

Table 3

NUMBERS, MEANS, AND STANDARD DEVIATIONS OF
LORGE-THORNDIKE INTELLIGENCE QUOTIENTS
BY METHOD AND GRADE LEVEL

	Method 1 T-S-T	Method 2 WPWT	Method 3 WPWOT	Method 4 C & P	Method 5 WB	Total
			Grade 2			
N	104	98	115	114	103	534
M	111.8	109.9	107.8	110.0	108.8	109.6
σ	10.8	10.2	11.6	11.3	11.1	11.1
			Grade 3			
N	109	118	126	117	108	578
M	109.6	107.5	107.9	110.1	109.0	108.8
σ	11.0	10.8	9.9	11.0	10.6	10.7

Statistical Design

The statistical analysis was accomplished in three steps, each employing a widely used, relatively standard statistical design.

The first stage was an analysis of covariance of the HASTT, NISST, and STET post-test scores, employing the respective pre-test score, IQ, and Teacher Quality Index as control variables.

The second stage was an analysis of post-test minus pre-test scores (gains) in a treatment of levels analysis of variance design, with IQ as the levels variable. To secure proportionality, surplus cases in cells were discarded by random procedures.

The third stage was a simple analysis of variance among classroom means.

Description of Methods

All classrooms devoted thirty minutes each day to the basic composition program which included proofreading and correcting practices. This was a common element in each classroom. In addition, the usual fifteen-minute spelling period was increased to twenty minutes for purpose of the experiment.

Method 1

Method 1, Test-Study-Test (T-S-T), followed the recommendations in the basal spelling text (Horn, Ashbaugh, Horn, Spelling We Use). The majority of the teaching time was confined to dictation-type testing, oral proofreading, and reporting of test scores. Teachers generally did not make application of generalized spelling skills. The procedure for both grades was identical with one exception. Since spelling was a new subject to the second grade pupils, the second grade teacher was directed to introduce only one-half of the new words on Monday and the other half on Tuesday until the 19th week of spelling. After that, all of the words in the lesson were introduced on Monday as in the third grade.

Monday

1. The teacher and the class surveyed the work of the week including pronouncing new words and discussing directions or information for Monday's work. The children read the words silently in their books as the teacher pronounced the words orally. The children then pronounced the spelling word in concert after the teacher. Occasionally, the teacher asked a single child to pronounce while others listened. The teacher made sure the meaning was clear by using the word in a sentence or giving a definition of it, and handled writing difficulties by writing the work on the chalkboard when necessary. One to two minutes was usually needed for pronouncing the words during the Monday introductory period.

2. The second step was to test. Each word was pronounced, used in an illustrative sentence, and pronounced again. The illustrative sentences provided in the text were used. The pupils were instructed not to write until the words were pronounced the second time. The test seldom required more than four or five minutes.

3. The third step was to score the test so that each pupil could determine which words were spelled incorrectly.

The teacher instructed each pupil to correct his own test as she spelled the word aloud. This "proofreading" technique placed responsibility for learning the misspelled words on the child. The teacher inspected each of the children's papers to confirm the child's "proofreading". This practice also identified the individuals needing the most help. After the correction period, the children studied the correct spelling of words they had missed. If pupils misspelled very few words, they were allowed to begin other exercises in the text.

Tuesday

1. During the spelling period on Tuesday, the pupils studied the words missed on Monday. They followed the study guide given in the text manual. The teacher made sure that the pupils corrected their tests carefully and used the study method prescribed for them. Pupils who missed the most words on Monday were given additional help by the teacher.

2. When the pupil indicated his mastery of the spelling words, he began work on the exercises provided in the lesson.

Wednesday

1. The pupils were tested over the new and review words for the week. Since word meanings were identified on Monday, the teacher did not use the words in sentences during the test on Wednesday or Friday unless the spelling words were homonyms.

2. Each pupil corrected his paper as the teacher spelled the words aloud and studied the words he missed on Wednesday.

3. If no errors were made or the pupil felt he knew all of the words, he continued the exercises in the text which were provided for the pupil.

Thursday

1. The pupil studied the words he missed on Wednesday. When he was able to spell all of the words correctly, he then continued to work on the exercises in the book. It seemed evident that the authors of the text had not planned for one hundred minutes a week to be used since the exercises in the book did not seem to provide enough activities for the children, (See page 6 of the text.) Therefore, the following activities, believed to be within the philosophy

of the method, supplemented the text exercises.

1. Study the review words listed in the lesson.
2. Write sentences using the spelling words.
3. Make directions telling the five steps for studying a word.
4. Make a chart for the room showing the five steps.
5. Make a graph on which to record the spelling scores.
6. Find a partner who needs help and work with him on his spelling.
7. Use the word list in the back of the speller, find a partner to pronounce words and try to see how many words each can spell. Write the words rather than spell them orally.
8. Teachers work with small groups of children who have had spelling problems.
9. If the child exhausts this list and has a perfect paper, he may sometimes be excused from spelling class.

Friday

1. The pupil was tested over both the new and review words on Friday. The teachers pronounced the word without using it in a sentence, except for homonyms, and the pupil wrote the word.

2. The test was corrected by the child in the same manner as on Monday and Wednesday with the teacher supervising his accuracy in scoring.

3. The pupil immediately corrected any errors and studied the words missed. Friday's score was compared with Monday's score and indicated on a pupil-made graph.

Directions for study were as follows:

Five Steps in Learning to Spell a Word

1. Look at the word. Say it softly.	mother
2. Look at the word. Say the letters.	m-o-t-h-e-r
3. Close your eyes.	
Say the word softly.	mother
Say the letters.	m-o-t-h-e-r
4. Look at the word to see if you spelled it right.	mother
5. Write the word.	mother
Look at the book to see if you spelled it right.	

Methods 2 and 3

Method 2, Word Perception With Test, (WPWT), devoted twenty minutes daily to a spelling period which applied the word perception skills which were taught in reading to attack new words in the basal spelling list (see Appendix D). A weekly review test was used, with results reported to pupils.

Method 3, Word Perception Without Test, (WPWOT), also devoted twenty minutes daily to a spelling period which applied word perception skills. The only difference between this method and Method 2 was the elimination of the weekly test.

Methods 2 and 3 were taught in exactly the same way in both Grades 2 and 3. The word lists were taken from the same texts as were used in the Test-Study-Test method.

A specially prepared spelling guidebook was provided for each teacher to use in the daily twenty minute spelling period, (See Appendix A). This guidebook contained an explanation of the program and 35 lesson plans of the specific work to be done for each lesson for each grade. An appendix contained a number of spelling games for the pupils to use, as well as suggested activities for challenging the superior speller.

Unlike the Test-Study-Test method, the basal list was not presented at one time, but rather each word was studied and analyzed individually, as well as used as the basis for the addition or substitution of phonetic or structural elements. During the daily spelling instruction period, several words from the basal list were studied. The number of words varied, depending on the techniques and applications which were utilized. By substituting consonants or vowels or adding endings, "new" words were made from the "old" word from the basal list, and, thus, as many as twenty words were learned by the pupil in one class period.

The class was divided in preparation for the spelling period, with one group at the chalkboard and the other seated. Those pupils writing at the chalkboard exchanged places with those at their seats after working with one word from the word list, and the study continued with the next word. All children had a turn at the chalkboard within a given period. The teacher worked with all of the children at all times and maintained awareness of board work as well as seat work as she walked about the room.

As the teacher pronounced a word from the basal list, all of the children wrote the word as they thought it should be spelled. This word had not been shown to them prior to pronounciation. The correct spelling was verified by either a pupil or the teacher, and those making errors corrected them. Sentences using the spelling word were elicited from the pupils, insuring its meaning. When the teacher felt the pupil could spell the basic word, phonetic and/or structural skills were then applied to the word. (Non-phonetic words were learned as sight words, e.g., "said," "on," and "would.")

Auditory training was provided to help the children discriminate the syllables. As the word was pronounced, either by the teacher or one of the pupils, the children tapped softly on their desks to indicate the syllables of that word. Example: "ba-nan-a." If syllables had not been taught in reading, the process of tapping merely became a game of listening for "parts" of the word and tapping them out. This provided a readiness for instruction in syllabification which came later.

After the basic word had been pronounced, spelled, defined, divided into syllables, and visually analyzed, it was ready for further phonetic and structural analysis.

The beginning of the words were identified as to initial consonants unless the word started with a vowel. The children learned that a beginning might be one; two; or three letters of a word as: soap, skip, slip, shirt, street, screen. As soon as the beginning was identified, the class began substituting one- two- or three-letter consonants. Example: The basic word "came" might be changed to: "fame, game, lame, name, shame, flame" by substituting the initial consonants of the word. The application of this principle was made only to words which were meaningful to, and within the children's understanding vocabularies.

Medial vowels were also identified and analyzed by substitution. Example: "bag to beg", "hit to hot", and "big to bug."

Endings were added to the root form of a basic word.

The above skills were introduced at various times throughout the week. At the end of the week, on Friday, a test over the basal word list was given to the children in Method 2, Word Perception With Test, but not to the children who used Method 3, Word Perception Without Test, which method substituted further word analysis for the time Method 2 used in testing.

The skills presented in Methods 2 and 3 are summarized as follows:

Phonetic Understandings Applied

1. Single consonants sounds: Initial and final
   example: bank, car

2. Two- and three-letter beginnings
   example: black, street

3. Long and short sounds of vowels
   example: mad, made, me

4. Vowels controlled by 'r'
   example: barn, her, bird, horse, church

5. Vowel combinations
   example: feet, book, food, saw, few, how, toy, found

6. Rhyme (This involves substitution of initial consonants).

Structural Understandings Applied

1. Forming of plurals by adding letter s
   example: flags

2. Forming of plurals by adding es
   example: boxes

3. Forming of plurals by changing y to i
   and adding es
   example: fly - flies

4. Writing of irregular plurals
   example: foot - feet

5. Dropping of final 'e' and adding ending
   example: come - coming

6. Doubling of final letter and adding ending
   example: dig - digging; fat - fatter; run - running

7. Writing of compound words
   example: outside, something

8. Finding root words
   example: raining (rain); parties (party)

9. Writing abbreviations
   example: Mr., Mrs., Mon., Jan.

10. Writing contractions
    example: cannot (can't); do not (don't)

11. Syllabification
    example: mon-ey; Sat-ur-day

The above are not all-inclusive, but typical.

Method 4

Method 4, Proofreading and Correcting (P & C), extended the basic composition program to fifty minutes each day without using a basal list of spelling words.

In the Proofreading and Correcting method, the child's own, independently-written composition formed the basis from which the spelling lesson was taught and used the application of phonetic skills, dictionary skills, and self-checking in relation to all of the language arts which are taught at this grade level. Each day the children wrote an original composition, independent of teacher help. Some children wrote on the chalkboard, others wrote at their desks. The teacher motivated the writing in any number of ways. Following are a few examples of the numerous ideas which teachers used for motivation for creative writing:

1. Write adventures of characters in reading texts.

2. Write "Why" stories, as "Why the polar bear is white".

3. Describe a lost article.

4. Write a composition entitled "If I were a father" or "If I were a mother".

5. Utilize weather changes and write compositions about wind, rain, snow.

6. Write about a famous person in government, entertainment field, sports.

7. Tell what age you would like to be and why.

8. Have a story starter box. Include beginnings to stories which can be completed.

9. Have a picture file. Permit children to go to the file and select a picture to write about.

10. Rewrite news heard on radio or TV.

The teacher discussed items such as these for five or ten minutes, allowing children to give ideas and suggestions about the subject. When the subject was clear and interest high, the children began to write their own ideas about it. Pictures, films, trips, experiences, an art project or science experiment made good material for these writing lessons.

Children were free to use the dictionary for the spelling of a word, ask help from a classmate, refer to a basic reader or other reference texts, or apply phonetic skills to write a word without help from the teacher. The composition had to be "his own" and not "copied" from a text or reference book.

After completion of the individual composition, each child reread his story silently and checked it for errors, by using punctuation, capitalization, and usage charts, in addition to the use of dictionaries for a check on his spelling. The child and a classmate checked the composition together for errors in spelling, punctuation, capitalization, and other language usage skills and corrected it wherever necessary for the second proofreading. The classmate printed his initials at the end of the composition which was then ready for the class to discuss. During the language arts period the author read his work and asked first for positive comments and second for criticisms that would help him in writing his next composition. The class criticized the story with the following criteria in mind:

1. Quality of handwriting used
2. Indentation of new paragraphs
3. Margins
4. Title: Is it properly capitalized?
   Does it match the story?
5. Capitalization
6. Punctuation
7. Paragraphing
8. Tense: Has it remained the same throughout the story?
9. Number: Has it remained consistent?
10. Does the paragraph tell about one thought?
11. Is the sentence structure correct?
12. Is the spelling correct?
13. Does he use a good choice of words?
14. What is the quality of content?
    a. Is it clever, interesting, surprising, humorous, etc?
    b. Does it have continuity?

c. Are thoughts repeated?

d. Does each sentence tell something?

e. Is there a good beginning sentence?

f. How many different ideas does it have?

As corrections were made, the child underlined a misspelled word or encircled a capitalization error and did the actual correcting after the class went on to the next composition. The child used the dictionary to find the correct spelling, made the proper correction, and corrected the other composition errors indicated by the class. If the misspelled word was a high-frequency word, it was copied for a "demon" list for further study or reference.

It should be remembered that proofreading and correcting was a common element in the five methods in this study but Method 4 used an additional twenty minutes daily for the proofreading and correcting activity.

Method 5

Method 5, The Workbook method, (WB), employed a spelling workbook twenty minutes each day, taught the same basal word list as Methods 1, 2, and 3 and employed a weekly review test. The workbook lessons were developed so that the pupils could take over routine, thus freeing the teacher for individual pupil instruction. All lessons were planned in terms of the Test-Study-Test method.

Children in both grades used workbooks designed for their particular grades (Horn, Ashbaugh & Horn, Spelling We Use) for their text in spelling.

The plan for this method was similar to that of Method 1, Test-Study-Test, except that the children used a consumable workbook as enrichment material in addition to the word list. The plan of introducing half the words on Monday and the other half on Tuesday to second grade children was followed in this method also. A teacher's manual was provided in the teacher's edition of the workbook. The following study plan was followed.

Monday

The pupils read a copy of the word list as the teacher pronounced new and review words. The teacher first pronounced a word with the pupils pronouncing the word after her. As they did this exercise together, the pupils looked closely at each part of the word. After the pupils were able to pronounce the words, a workbook test was given. The teacher pronounced the word, used it in an illustrative sentence and pronounced the word again. The pupils did not write until they had heard the word the second time. On Wednesday and Friday illustrative sentences were not used unless the word was a homonym. After the test, the pupils checked their papers as the teacher pronounced and spelled the word. Each child then marked a record in the workbook, with a minus sign if he missed a word and a plus sign if he wrote it correctly. The teacher supervised the correction of papers for accuracy. The progress record for Monday, Wednesday, and Friday was omitted for the second grade.

In the study of the word, five steps were used. They were given in the workbook as follows:

Step 1. Look at the word in your book. Pronounce it plainly. Look at each part as you say it.

Step 2. Look at the word and say the letters. Spell each part.

Step 3. Close your eyes. Try to see the word as it is in your book. Try to see each part of the word as you pronounce it in a whisper. Then say the letters.

Step 4. Look at the word in your book. If you did not spell it right, do steps 1, 2, and 3 again.

Step 5. Write the word. Compare yours with that in the book. If it is right, cover the word and write it again. If it is right this time, write it again.

If it is not right after completing step 5, go over steps 1, 2, 3, 4 again. Keep trying until you can write the word without making a mistake. (Page 8 of Workbook, Grade 3)

After studying the words missed on Monday, the exercises called "Helps for Your Spelling" in the workbook were started.

Tuesday

On Tuesday, the child studied the words missed on Monday, using the five steps outlined. At the beginning of the year the teacher helped the children learn these steps and provided close guidance to make sure they were used. When the child had learned the words misspelled on Monday, he completed the "Helps" he may have started on Monday.

Wednesday

The child took the test over all new and review words on Wednesday, checked them carefully in the same manner as on Monday. After the test, the child studied the words missed on the Wednesday's test and, if he finished before the end of the period, he started workbook exercises.

Thursday

On Thursday the child again studied the words missed on Wednesday using the five steps for study. After he had learned the words, he continued work on the exercises in the "Helps."

Friday

The weekly test was given on Friday. The child corrected his own paper while the teacher spelled the words and again supervised correction. The pupil marked the graph provided in his workbook to show his progress and studied the words missed on Friday.

Summary of Methods

A summary of the characteristics of each method is shown below. The major portion of the common element was used in actual composition. Proofreading, correction, and group discussion of the errors of all types, consituted a relatively minor portion of the total time. These activities were concerned not only with spelling, but also with punctuation, capitalization, and other language skills.

	Method 1	Method 2	Method 3	Method 4	Method 5
	Test-Study-Test (T-S-T)	Word Perception With Test (WPWT)	Word Perception Without Test (WPWOT)	Proofreading and Correcting (P & C)	Workbook (WB)
Common Element	30 min. of write, proofread, and correct	30 min. of write, proofread, and correct	30 min. of write, proofread, and correct	30 min. of write, proofread, and correct	30 min. of write, proofread, and correct
Method Variation	20 min. of test-study-test	20 min. of application of reading skills with weekly test	20 min. of application of reading skills without weekly test	20 min. of write, proofread and correct without weekly test	20 min. of workbook with weekly test

Supervision and Control

In order to clarify the experimental method for each participating teacher and to assure strict adherence to assigned method, control over this phase of study was exercised through in-service meetings and planned observation and supervision.

Observation and Supervision

The elementary school principal of the Noelridge Primary School was assigned as the instructional supervisor of this project. She was chosen for this assignment because of a superior background of training and experience in research and supervision, because of her familiarity with the different methods of teaching spelling, and because of personal characteristics which would make her acceptable to the participating teachers. She was instructed to observe and supervise the teaching of spelling of the fifty teachers engaged in this project. Observations began on October 13, 1962, after the teachers had been teaching the assigned method about one week, and ended April 29, 1963, a week before post-tests were administered.

Three half-days per week were used in observation. Each of the fifty teachers was visited three times during the study. The first two series of observations were made during the morning hours and the last one in the afternoon session of school.

The principal of each school visited was notified of the observation schedule for the day. The principal in turn notified the teachers who arranged their daily plan to meet the observer's schedule. The observer quietly observed the class during the twenty-minute spelling period but made no notes in the presence of the class or teacher. The observer held a brief conference with the teacher before leaving the room and discussed the conference whenever possible with the building principal.

In-Service Meetings

Two in-service meetings were held during the year. The first series of meetings were held during the month of September as follows:
September 18, 1962 - Method No. 4 - Correction and Proofreading
September 21, 1962 - Method No. 2 - Word Perception With Test
September 24, 1962 - Method No. 1 - Test-Study-Test
September 27, 1962 - Method No. 3 - Word Perception Without Test
September 28, 1962 - Method No. 5 - Workbook

The Consultant for Primary Education conducted the meetings which were attended by the Director of Elementary Education, the instructional observer of the research, several principals, and the participating teachers. Separate meetings were held to explain the characteristics of each method. The five second-grade teachers and the five third-grade teachers who were teaching the same method attended the appropriate meeting. These meetings included a review of the proofreading and correcting techniques which were a part of all five methods, and a thorough discussion and demonstration of the methods to be taught. (The presentation and discussion of the methods followed very closely the description given in the previous section of this report.) The teacher's responsibility toward the method she used and the position of the observer was clarified. As soon as each in-service meeting was concluded, the teachers began teaching the experimental program according to their assignment.

The second group of in-service meetings were held after the first series of observations were made in the classrooms. It became apparent at this time that there was need for greater uniformity of teaching within the method and for the improvement of teaching techniques.

These meetings, which were held during the first week in December, 1962, were attended by the same personnel as the first series of meetings with the addition of the Director of Research for the school system. This group met for a period of one hour at each of three meetings to discuss and further clarify any questions or problems that had arisen during the first few weeks of the study. Meetings were organized as follows:

1. Teachers participating in Method No. 1 and Method No. 5 met together because of the similarity of their methods.

2. Teachers participating in Method No. 2 and Method No. 3 met together for the same reason.

3. Teachers in Method No. 4 met alone.

The Consultant for Primary Education opened the meeting by explaining the purposes of the meetings. The Director of Elementary Education then made brief comments upon the importance of being "research minded" and teaching with a "research attitude". It was pointed out, as a reminder, that research can be contaminated by using methods or techniques other than those outlined for the method which had been described and assigned, and that it was important for each teacher to understand and follow the instructions she had been given concerning her method. He further pointed out the importance of quality teaching in each method.

The second part of each meeting was devoted to a report of general observations made during the first series of visitations. These were brought before the total group to further define the methods and procedures for the teachers. These points will be mentioned in the next section of this report.

Thirdly, the Consultant for Primary Education spoke on the points brought to the group by the instructional observer and together with the Director of Elementary Education and the Director of Research made specific suggestions to be followed in order to keep the methods "pure". These suggestions also appear in the next section of the report.

Finally, teachers were given time to ask questions which still might remain unanswered, but there were few asked since the previous discussion was purposely very thorough and specific. This was the last group of in-service meetings which were held during the study.

Report of Observations Made at the Second Series of In-Service Meetings

These observations are presented in this report primarily for three reasons: they call attention to certain characteristics of each of the methods which should be taken into consideration before deciding on method; they point to certain inadequacies of the application of "pure" methods; and they indicate the extent to which in the initial stages of the study inadvertent departures were made in prescribed method.

1. Although most teachers were very accurate about the time devoted to this period, others gave slightly less time than the required twenty minutes or more than twenty minutes during the first week or two of the study.

2. In a few classrooms there was a tendency to use more oral spelling than was prescribed for that method. Such activities as a "spelling bee" or spelling orally around the class for review were not a part of any of the five methods as defined.

3. In Methods No. 2 and No. 3 (Word Perception) the teachers gave more attention to the children working at the chalkboard than to those working at their seats.

4. Some teachers were not supervising adequately in cases where the children corrected their own work.

5. Teachers who used Method No. 1 (Test-Study-Test) and Method No. 5 (Workbook) were at a loss to know how to spend the full twenty minutes on spelling on Tuesday and Thursday. They felt there was a lack of material provided in the exercises and they did not want to contaminate the method by injecting their own ideas.

6. In some cases, teachers of Methods No. 1 and No. 5 took far too long in introducing the words on Monday. In a few cases they labored over the introductions most of the period.

7. In general, there was a tendency toward "telling" children answers rather than asking them to make use of their word analysis skills.

8. Most teachers in Methods No. 1 and No. 5 were not consistent in teaching the children to use the five steps for the study of a word.

9. In Methods No. 2 and No. 3 (Word Perception) a number of teachers had a misconception of consonant substitution. Often the teacher was pronouncing the word, showing the children how to spell it, and then substituting the consonant. The only question asked was, "What new word is formed?" with one child giving the response. The observer felt that the children were not learning to spell but rather following directions. The method did not include this as part of the method except at the very initial stage.

10. In Method No. 4 (Proofreading), some teachers permitted the children to correct their compositions while the class waited for them to make the correction. This cause delay and disinterest and was not intended to be a part of this method. Also, there were instances where few positive comments were given preceding the critical comments which tended to discourage the children.

All of the above comments were reported to the group during the second in-service meeting and reviews of the proper procedures were given.

After the observer had presented a report of the visitations, the following suggestions and clarifications were made by the Consultant for Primary Education and the Director of Elementary Education.

General Comments

1. Oral spelling was not a part of any of the methods in the study but it was considered permissable for children to respond orally to a question concerning the proper spelling of a word. Such activities as spelling bees and oral spelling "around the class", however, were to be eliminated.

2. It was very important to maintain twenty-minute periods in one time block.

3. The teacher must be alert and supervise seat work adequately. Since approximately two-thirds of the pupils were working at their desks, it was necessary that their work be as carefully checked and supervised as that of the pupils at the chalkboard.

4. Those who gave tests must administer them and correct them in the same manner. For example: The teacher pronounced the word, used it in a sentence and pronounced it again, after which the pupil wrote the word. In correcting the work, the teacher pronounced the word, spelled the word and the child corrected his work. It was necessary that the teacher move about through the room in order to check the accuracy of each pupil's correction. Words missed on any day of the week must be corrected and studied during that period if any part of the period remained.

5. Studying spelling words on the chalkboard or orally immediately before any written test was discouraged.

Specific Comments

A. Method No. 1 (Test-Study-Test) and Method No. 5 (Workbook)

1. All words introduced on Monday should not take more than a minute or two of the period.

2. Children should become proficient in the use of the five steps for the study of a word.

3. In the second grade, one-half the words were to be introduced on Monday and one-half on Tuesday.

4. Teachers who needed additional suggestions for Tuesday and Thursday were given these suggestions:

   a. Children must first complete the exercises listed in the book or workbook.

   b. They may study review words listed in the lesson.

   c. They may alphabetize their spelling and review words.

   d. They may write sentences using the spelling words in them.

   e. They may write directions telling the five steps in studying a word.

   f. They may make a chart for the room showing the five steps in studying a word.

g. In the textbook method, they may make a graph on which to record their scores.

h. A child may find a partner and help him with his spelling. (They should do written work with him rather than oral.)

i. Children may use the word list in the back of the book to test their skill in spelling new words. They may work with partners but it is not necessary to commit all of these words to memory.

j. Teachers may work with small groups who have spelling problems.

k. If the children exhaust this list and have a perfect paper, they may sometimes be excused from spelling class.

B. Method No. 2 and No. 3 (Word Perception)

1. The teachers were instructed to omit the references to the textbook made in the syllabus.

2. The games which are listed in the appendix of the guide book are a part of the methods and may be used at the discretion of the teacher.

3. Booklets which are made by the children and include spelling words and other words useful to the child are considered permissable. These booklets resemble a dictionary.

4. The syllabus which is provided for these two methods should be used to guide the teacher during the class period. She should not use the textbook at all.

5. The substitution of letters, prefixes, suffixes, and vowels should be more a process of using the child's skill than "telling" by the teacher or other class members.

6. Close adherence to the guide will be considered preferable to the use of the teacher innovations.

7. The textbook may be used as a reference book outside the twenty-minute spelling period.

C. Method No. 4 (Proofreading)

1. The twenty-minute period should be a continuation of the regular proofreading and correcting period.

2. This period should make use of all language skills presented for the grade level as well as spelling skills.

3. Increased attention should be given to the content of the composition.

4. A variety of word usage should be encouraged. EX: Instead of overuse of "said" supplant this with such words as "called, replied, whispered, screeched."

5. In third grade simple parts of speech can be discussed. EX: nouns, verbs, adjectives

6. More colorful words can become a part of the composition.

7. Alert children to the use of the same tense throughout the narrative.

8. Help them to be conscious of the number and keep it consistent.

9. Encourage imaginative compositions.

10. Encourage use of descriptive words.

Report of Later Observations

After the second in-service meeting during the first week in December the observer continued to make visitations to the classrooms of each experimental teacher until April 29, 1963.

The teacher seemed to carry out the assigned method with greater confidence and assurance at this time. The observer had the impression that each teacher sincerely wanted to conduct the spelling class with as much accuracy and precision as possible. Whereas, there seemed to have been a number of discrepancies during the first series of visits, there seemed to be more uniformity the remainder of the year. Teachers made a greater effort to carefully supervise the total group as they wrote and corrected their work. The time element was carefully controlled by all teachers as well as the use of proper techniques common to a method. Teachers frequently asked the observer for suggestions for improvement in the work. In general, the teachers adhered much more uniformly to assigned methods after the second in-service meeting.

The last series of observations were made in the afternoon and failed to show any difference in pupil interest or motivation in contrast to morning observations.

Teacher's Reaction to Control

The teachers appeared interested and attentive during the first in-service meeting. It was the first time many of them had participated in an experimental study and they indicated that they felt privileged to have a part in it. They took notes and asked questions during the sessions. After teachers had been teaching the method a few weeks, some of them asked that another in-service meeting be held to further clarify procedural points. At the close of the study, some teachers concluded that participation had been a pleasure, but others felt that teaching spelling would have been more enjoyable without the controls which were required for this investigation.

There was little resistance toward the observer when it was clear that the purpose was to insure the "purity" of each method for reliable research. After the first series of observations, the teachers seemed more relaxed in the presence of the observer. No correction nor comment regarding classroom management was made. Most teachers quickly perceived that the only purpose of the observer was that defined at the beginning of the project.

ANALYSIS OF DATA AND RESULTS

Analysis of Objective Criterion Measures

While there was *a priori* reason to believe that the different experimental spelling methods would produce different and measurable effects on spelling ability, it was important to determine whether the order of effectiveness of the methods could be generalized to other classrooms. It was also important to determine whether the order of effectiveness of the different spelling methods was maintained across grade levels. In addition, there was interest in the interaction of method and ability level, i.e. whether one method might work best with superior students, another with "average students", etc.

Control over teacher and pupil differences which were thought to be important was established in two ways: by matching experimental groups as closely as possible in teacher quality and in estimated spelling ability; and by exercising statistical control through analysis of covariance. As noted in the PROCEDURE, teacher differences as reflected by the Teacher Quality Index (TQI) were balanced throughout the experimental spelling methods. The assignment of teachers to experimental methods, while based upon teacher preference and therefore not *strictly* random, could be thought of as an unbiased assignment which spread the effect of teacher differences equally within the experimental treatments. Control over pupil ability in spelling was exercised by estimating spelling performance from the previous year's class performance on the Iowa Tests of Basic Skills and distributing estimated spelling ability as closely as possible over the methods.

Reliability of the New Iowa Spelling Scale Test (NISST) and the Horn-Ashbaugh Spelling Textbook Test (HASTT)

The reliability of measurement of the HASTT and the NISST at the beginning and at the end of the experiment was determined by estimating reliabilities for the full-length tests from correlations between equivalent part-test forms using the Spearman-Brown formula. As noted in the PROCEDURE, the spelling words in each of the tests were arranged in order of the New Iowa Spelling Scale percent of correct response levels. Both the HASTT and NISST were administered in three sessions for Grade 2 with the subtests administered in the first session being composed of Items 1,4,7,10.....58; Subtest II was composed of Items 2,5,8,11.....59, and Subtest III of Items 3,6,9,12.....60. Subtests I and III were used as equivalent measures for computing the reliability coefficients in Table 4. Both the HASTT and the NISST were administered in two sessions to Grade 3 with the first subtest being composed of thirty spelling words 1,3,5,7.....59 and the second subtest of the remaining even-numbered spelling words producing part-scores for each pupil for computation of a reliability coefficient. The reliabilities of the HASTT and the NISST as reported in Table 4 are all high, positive, and significant.

Table 4

ESTIMATED RELIABILITY COEFFICIENTS OF
THE HASTT AND NISST FOR GRADES 2 AND 3

	Grade	
	2	3
HASTT Pre-Test	.95	.96
HASTT Post-Test	.96	.96
NISTT Pre-Test	.95	.95
NISST Post-Test	.94	.94

Pre- and Post-Experiment Spelling Ability

Pre-and post-experiment scores on the HASTT and NISST and the scores on the STET (Sensitivity to Error Test) administered at the end of the experiment are shown in Tables 5 and 6. It is not surprising that the average spelling scores were higher on the HASTT than the NISST in each grade since it is the spelling test composed of less difficult words which were familiar to the child as a part of the basic spelling program. Children assigned to Method 4 (Correction and Proofreading) at Grade 2 and Method 1 (Test-Study-Test) at Grade 3 have substantially lower pre- and post-test scores than children assigned to the other methods at those grade levels. Controlling the effect of this pre-experimental difference as well as the effect of this difference on uncontrolled gain scores in the HASTT and NISST will be discussed later in connection with the analyses of the criterion measures.

Table 5

NUMBER, MEAN, AND STANDARD DEVIATION OF PRE- AND POST-TEST SPELLING SCORES BY GRADE LEVEL AND METHOD

Grade 2

		Method 1 T-S-T		Method 2 WPWT		Method 3 WPWOT		Method 4 C & P		Method 5 WB		Total	
		Pre-Test	Post-Test	Pre-Test	Post-Test	Pre-Test	Post-Test	Pre-Test	Post-Test	Pre-Test	Post-Test	Pre-Test	Post-Test
HASTT	N	104	104	98	98	115	115	114	114	103	103	534	534
	M	29.0	52.0	28.4	49.6	29.3	53.3	24.4	48.6	31.6	51.7	28.5	51.1
	σ	15.72	8.17	16.17	11.66	16.34	7.35	14.43	11.78	15.50	10.66	15.76	10.16
NISST	N	104	104	98	98	115	115	114	114	103	103	534	534
	M	14.1	50.6	13.4	46.8	14.3	52.7	10.0	41.9	16.7	51.6	13.6	48.7
	σ	13.22	11.10	13.67	15.91	14.05	9.30	9.54	15.29	13.66	13.38	13.03	13.73
STET	N	--	104	--	98	--	115	--	114	--	103	--	534
	M	--	15.3	--	15.3	--	16.4	--	15.4	--	16.7	--	15.8
	σ	--	3.06	--	3.17	--	3.18	--	3.37	--	2.49	--	3.12

Table 6

NUMBER, MEAN, AND STANDARD DEVIATION OF PRE- AND POST-TEST SPELLING SCORES BY GRADE LEVEL AND METHOD

Grade 3

		Method 1		Method 2		Method 3		Method 4		Method 5		Total	
		T-S-T		WPWT		WPWOT		C & P		WB			
		Pre-Test	Post-Test	Pre-Test	Post-Test	Pre-Test	Post-Test	Pre-Test	Post-Test	Pre-Test	Post-Test	Pre-Test	Post-Test
	N	109	109	118	118	126	126	117	117	108	108	578	578
HASTT	M	27.5	43.8	35.7	50.4	32.2	48.5	35.3	50.2	36.5	49.5	33.4	48.5
	σ	16.75	13.91	15.78	11.33	16.29	11.08	16.63	10.42	15.39	12.21	16.45	12.00
	N	109	109	118	118	126	126	117	117	108	108	578	578
NISST	M	18.5	45.2	25.5	49.5	21.7	44.6	26.2	47.3	26.6	49.7	23.7	47.2
	σ	16.54	14.68	16.43	12.56	16.63	15.03	17.25	14.38	16.05	12.88	16.82	14.07
	N	--	109	--	118	--	126	--	117	--	108	--	578
STET	M	--	15.8	--	17.1	--	16.3	--	17.9	--	17.0	--	16.8
	σ	--	2.70	--	2.38	--	3.04	--	2.51	--	2.83	--	2.79

Relationships among Major Variables

The intercorrelations among pre- and post-experiment NISST, HASTT and STET, and TQI and IQ scores are shown in Tables 7 and 8 for Grades 2 and 3, respectively.

The correlations between NISST and HASTT are high, positive, and significant for Grades 2 and 3 before (r = +.86, +.92) and after (r = +.92, +.89) experimental treatment and, in a sense, provide concurrent validity estimates. The correlations between spelling ability on pre- and post-experimental tests were relatively high for Grade 3 pupils (r = +.74, +.75, +.80 and +.84) and for Grade 2 on the HASTT (r = +.72) but they were lower on the more difficult NISST (r = +.53, +.52). It is of interest to note that the HASTT pre-test was a better predictor of spelling ability on the more difficult NISST after experimental treatment (r = +.71) than was the NISST pre-test (r = +.53).

The relationship of TQI to intelligence has no real meaning, nor was the relationship expected to be different from zero except on a chance basis in view of the expected distribution of intelligence among classrooms (r = +.09 and +.13). Further, the expectation of little or no relationship between TQI and spelling ability was supported by a range of correlations from a +.14 to a +.20 for Grade 2 and for Grade 3 from a +.04 to +.10.

Generally, low positive correlations were obtained between intelligence as measured by the Lorge-Thorndike Intelligence Tests and the criterion variables (r ranged from +.24 to +.35) with higher relationships showing up in correlations of IQ with the easier test (HASTT) and lower with the STET.

In brief summary, TQI was not related to spelling ability before or after the experiment while IQ had a slight but significant relationship. The HASTT pre-test score was the best predictor of performance, not only on the NISST and HASTT post-tests but also on the STET.

Analysis of Method Effectiveness

While *post hoc* analysis of the relationships suggests the lack of any practical importance of TQI associated with spelling improvement, statistical control of this variable

Table 7

INTERCORRELATIONS AMONG NISST AND HASTT PRE- AND POST-TESTS, LORGE-THORNDIKE IQ AND TEACHER QUALITY INDEX FOR GRADE 2

	Teacher Quality Index	Lorge-Thorndike IQ	NISST Pre-Test	HASTT Pre-Test	NISST Post-Test	HASTT Post-Test	STET
Teacher Quality Index		.09	.20*	.20*	.14	.18	.19*
Lorge-Thorndike IQ	.09		.35**	.35**	.22*	.27**	.24*
NISST Pre-Test	.20*	.35**		.86**	.53**	.52**	.50**
HASTT Pre-Test	.20*	.35**	.86**		.71**	.72**	.61**
NISST Post-Test	.14	.22*	.53**	.71**		.92**	.67**
HASTT Post-Test	.18	.27**	.52**	.72**	.92**		.65**
STET	.19*	.24*	.50**	.61**	.67**	.65**	

**Reliably different from zero at the .01 level.
*Reliably different from zero at the .05 level.

Table 8

INTERCORRELATIONS AMONG NISST AND HASTT PRE- AND POST-TESTS, LORGE-THORNDIKE IQ AND TEACHER QUALITY INDEX FOR GRADE 3

	Teacher Quality Index	Lorge-Thorndike IQ	NISST Pre-Test	HASTT Pre-Test	NISST Post-Test	HASTT Post-Test	STET
Teacher Quality Index		.13	.09	.09	.09	.10	.04
Lorge-Thorndike IQ	.13		.29**	.31**	.30**	.32**	.24*
NISST Pre-Test	.09	.29**		.92**	.74**	.75**	.59**
HASTT Pre-Test	.09	.31**	.92**		.80**	.84**	.57**
NISST Post-Test	.09	.30**	.74**	.80**		.89**	.63**
HASTT Post-Test	.10	.32**	.75**	.84**	.89**		.59**
STET	.04	.24*	.59**	.57**	.63**	.59**	

**Reliably different from zero at the .01 level.
*Reliably different from zero at the .05 level.

was exercised through multiple covariance procedures. The rationale underlying this decision was based on the notion that the cumulative effect of teacher quality would show up across the months the pupils were under a particular experimental treatment. Covariance control was also exercised over IQ and initial spelling ability (pre-test score). Therefore, multiple covariance analyses controlling TQI, IQ and the appropriate pre-test spelling score were made on the final NISST, HASTT, and STET scores for Grades 2 and 3 separately. Tables 9, 10, 11, and 12 contain the criterion means by method, adjusted means by method, multiple regression coefficient and equation, summary analyses of covariance, and the order of effectiveness of the spelling methods. Especial note should be taken of the order of effectiveness of the experimental spelling methods which are reported at the bottom of each of these tables. The order is based upon the adjusted means in the same table and are reported for ease of reading. The significance of difference between adjacent adjusted means in order of effectiveness is reported in conventional fashion. It should also be noted that these data are abstracted from and complemented by significance tests between all possible combinations of experimental spelling methods for all criteria and gain scores for Grades 2 and 3 which are reported in Table 24. Thus, while the Word Perception Without Test method was not significantly superior to the adjacent Test-Study-Test method, it was significantly superior to the Workbook method, Word Perception With Test method and Correction and Proofreading method. Again, the significance of adjacent methods in the order of effectiveness reported in Tables 9 through 14 are better understood and complemented by thorough inspection of Table 24.

The two covariance analyses reported in Tables 9 and 10 suggest a non-significant superiority of the Word Perception Without Test method over the adjacent Test-Study-Test method; however, additional information from Table 24 shows the significant superiority of Word Perception Without Test over the Workbook, Word Perception With Test, and Correction and Proofreading methods. In addition, the Test-Study-Test method, while not significantly different from the Word Perception Without Test method, was significantly different from all methods that were inferior to it in order of effectiveness except the Workbook method when the NISST performance was analyzed. Further, a similar finding was obtained when comparing Test-Study-Test with methods inferior to it in terms of order of effectiveness using the test of basal words (HASTT). A similar order of effectiveness of spelling methods on the criterion at Grade 2 was obtained where the criterion used was based on the child's ability

Table 9

COVARIANCE ANALYSIS OF GRADE 2 POST-NISST

Number, Mean, Adjusted Mean, Multiple Regression Coefficient and Equation

	Method 1 T-S-T	Method 2 WPWT	Method 3 WPWOT	Method 4 C & P	Method 5 WB
N	104	98	115	114	103
M	50.59	46.78	52.68	41.87	51.63
$\hat{Y}$	50.48	46.95	52.39	43.61	49.96

$$R_{\text{Post-NISST} \cdot \text{TQI IQ Pre-NISST}} = .532$$

$$\hat{Y}_{\text{Post-NISST}} = .236\ \text{TQI} + .055\ \text{IQ} + .535\ \text{Pre-NISST} + 33.963$$

Summary Analysis of Covariance of Post-NISST With TQI, IQ and Pre-NISST Controlled

Sources	df	SS	MS	F
Method	4	5166.85	1291.71	10.16****
Within	526	66875.68	127.14	
Total	530	72042.53		

**** $F_{.001} = 4.62$

Order of Effectiveness from High to Low

1.	Word Perception Without Test	52.39	NS
2.	Test-Study-Test	50.48	NS
3.	Workbook	49.96	NS
4.	Word Perception With Test	46.95	*
5.	Correction and Proofreading	43.61	

Table 10

COVARIANCE ANALYSIS OF GRADE 2 POST-HASTT

Number, Mean, Adjusted Mean, Multiple Regression Coefficient and Equation

	Method 1 T-S-T	Method 2 WPWT	Method 3 WPWOT	Method 4 C & P	Method 5 WB
N	104	98	115	114	103
M	52.05	49.59	53.34	48.61	51.66
$\hat{Y}$	52.12	49.69	52.87	50.42	50.01

$$R_{\text{Post-HASTT} \cdot \text{TQI IQ Pre-HASTT}} = .722$$

$$\hat{Y}_{\text{Post-HASTT}} = .213\ \text{TQI} + .021\ \text{IQ} + .455\ \text{Pre-HASTT} + 34.634$$

Summary Analysis of Covariance of Post-HASTT With TQI, IQ and Pre-HASTT Controlled

Sources	df	SS	MS	F
Method	4	831.01	207.75	4.29***
Within	526	25477.55	48.44	
Total	530	26308.56		

*** $F_{.005} = 3.72$

Order of Effectiveness from High to Low

1.	Word Perception Without Test	52.87	NS
2.	Test-Study-Test	52.12	NS
3.	Correction and Proofreading	50.42	NS
4.	Workbook	50.01	NS
5.	Word Perception With Test	49.69	

Table 11

COVARIANCE ANALYSIS OF GRADE 3 POST-NISST

Number, Mean, Adjusted Mean, Multiple
Regression Coefficient and Equation

	Method 1 T-S-T	Method 2 WPWT	Method 3 WPWOT	Method 4 C & P	Method 5 WB
N	109	118	126	117	108
M	45.21	49.52	44.56	47.28	49.67
$\hat{Y}$	48.37	48.67	45.79	45.43	47.97

$$R_{\text{Post-NISST} \cdot \text{TQI IQ Pre-NISST}} = .748$$

$$\hat{Y}_{\text{Post-NISST}} = .107 \text{ TQI} + .111 \text{ IQ} + .600 \text{ Pre-NISST} + 20.323$$

Summary Analysis of Covariance
of Post-NISST With TQI, IQ and Pre-NISST Controlled

Sources	df	SS	MS	F
Method	4	33689.86	8422.46	97.24****
Within	570	49371.95	86.62	
Total	574	83061.81		

**** $F_{.001} = 4.62$

Order to Effectiveness from High to Low

1.	Word Perception With Test	48.67	NS
2.	Test-Study-Test	48.37	NS
3.	Workbook	47.97	NS
4.	Word Perception Without Test	45.79	NS
5.	Correction and Proofreading	45.43	

Table 12

COVARIANCE ANALYSIS OF GRADE 3 POST-HASTT

Number, Mean, Adjusted Mean, Multiple Regression Coefficient and Equation

	Method 1 T-S-T	Method 2 WPWT	Method 3 WPWOT	Method 4 C & P	Method 5 WB
N	109	118	126	117	108
M	43.82	50.36	48.54	50.19	49.50
$\hat{Y}$	47.30	49.16	49.34	48.93	47.71

$$R_{\text{Post-HASTT} \cdot \text{TQI IQ Pre-HASTT}} = .839$$

$$\hat{Y}_{\text{Post-HASTT}} = .164\ \text{TQI} + .075\ \text{IQ} + .593\ \text{Pre-HASTT} + 19.616$$

Summary Analysis of Covariance of Post-HASTT With TQI, IQ and Pre-HASTT Controlled

Sources	df	SS	MS	F
Method	4	26124.83	6531.21	153.32****
Within	570	24282.07	42.60	
Total	574	50406.90		

**** $F_{.001} = 4.62$

Order of Effectiveness from High to Low

1.	Word Perception Without Test	49.34	NS
2.	Word Perception With Test	49.16	NS
3.	Correction and Proofreading	48.95	NS
4.	Workbook	47.71	NS
5.	Test-Study-Test	47.30	

to select misspelled and correctly spelled words from a prepared story (STET, Table 13). The analysis of the STET at Grade 2 is reported in Table 13 and shows the Word Perception Without Test method to be superior in terms of adjusted mean scores to all other methods but this is complemented by data from Table 24 showing a *significant* superiority to the Word Perception With Test and the Test-Study-Test method. Therefore, the highly significant F values obtained in these covariance analyses must be evaluated in terms of all possible combinations of adjusted means and not with regard to immediately adjacent methods as noted in the order of method effectiveness.

The three analyses of Grade 3 as reported in Table 11, 12, and 14 show highly significant F values among methods as in Grade 2. However, the general finding of the superiority of the Word Perception Without Test method at Grade 2 was borne out only in the covariance analysis where the criterion was the HASTT (Table 12). Again, complementary data show that Word Perception Without Test *and* With Test when considering final spelling ability on the HASTT were not significantly different, nor were these significantly different from the Correction and Proofreading method and the Workbook method. In fact, the only significance obtained between various combinations of these methods on the HASTT were obtained between Word Perception Without *and* With Test methods, and the Test-Study-Test method None of the adjacent adjusted means were significant in the order of effectiveness reported at the bottom of Table 12. Table 11 shows quite a different order of the NISST criterion. Again, it is noted that there are non-significant differences in adjacent methods when ordered from high to low. However, complementary data from Table 24 show the generally significant superiority of Word Perception With Test, Test-Study-Test, and Workbook method over the remaining two methods, but no significant differences among the first three mentioned. The inconsistent order of effectiveness of experimental spelling methods noted in Tables 11 and 12 on the two main spelling ability criteria show up, also, in the order of effectiveness of spelling method on Grade 3 pupils' ability to select misspelled words on the STET. In Table 14, however, the superiority of the Correction and Proofreading method is reflected by significant differences in adjusted mean ability when compared with all other methods.

Table 13
ANALYSIS OF STET GRADE 2

Number, Mean and Adjusted Mean

	Method 1 T-S-T	Method 2 WPWT	Method 3 WPWOT	Method 4 C & P	Method 5 WB
N	104	98	115	114	103
M	15.31	15.31	16.38	15.40	16.65
$\hat{Y}$	15.30	15.35	16.33	15.78	16.28

Summary Analysis of Covariance of STET With TQI, IQ and Pre-NISST Controlled

Sources	df	SS	MS	F
Method	4	1272.00	318.00	44.75****
Within	526	3730.99	7.11	
Total	530	5002.99		

**** $F_{.001} = 4.62$

Order of Effectiveness from High to Low

1.	Word Perception Without Test	16.33	NS
2.	Workbook	16.27	NS
3.	Correction and Proofreading	15.78	NS
4.	Word Perception With Test	15.35	NS
5.	Test-Study-Test	15.30	

Table 14

ANALYSIS OF STET GRADE 3

Number, Mean and Adjusted Mean

	Method 1 T-S-T	Method 2 WPWT	Method 3 WPWOT	Method 4 C & P	Method 5 WB
N	109	118	126	117	108
M	15.83	17.12	16.29	17.91	16.96
$\hat{Y}$	16.25	16.96	16.51	17.69	16.68

Summary Analysis of Covariance of STET With TQI, IQ and Pre-NISST Controlled

Sources	df	SS	MS	F
Method	4	1414.98	353.74	72.78****
Within	570	2770.58	4.86	
Total	574	4185.55		

**** $F_{.001} = 4.62$

Order of Effectiveness from High to Low

1.	Correction and Proofreading	17.69	*
2.	Word Perception With Test	16.96	NS
3.	Workbook	16.68	NS
4.	Word Perception Without Test	16.51	NS
5.	Test-Study-Test	16.25	

These inconsistent results make it difficult to generalize regarding the superiority of any one method when considering a developmental spelling program involving more than one grade. However, these results were obtained cross-sectionally and the rather consistent finding at Grade 2 regarding the superiority of the Word Perception Without Test method could not be checked beyond the experimental period. If longitudinal data had been gathered on spelling ability where students were influenced by the same spelling method over more than one year, more consistent results might have been obtained.

Analysis of Gain Scores for Grades 2 and 3

The interaction of intelligence with experimental method was tested on criterion gains, that is, post-test minus pre-test scores, using a treatments-by-levels design. Intelligence Quotient levels (IQ levels) were established by pooling all IQ's for each grade and computing Q_1 and Q_3 for that grade. The next step was to use Q_1 and Q_3 to separate pupils into the three IQ levels for each method. Since different numbers of students fell in the various experimental method-by-IQ-level cells, a proportional analysis was based on the random discard of excess pupils in each cell to the minimum cell frequency for that particular IQ level. Table 15 contains the number and mean IQ of pupils for the various treatment-by-level cells before and after pupils were randomly discarded.

Tables 16, 17, 18, and 19 report a treatments-by-levels (spelling method by IQ level) analysis of gain scores on the two main spelling criteria for Grades 2 and 3 separately. As in the previous analysis, significant differences among methods were obtained. However, there is little evidence for interaction between method and ability level. The F's were small and nonsignificant. Failure to find significant interaction between method and IQ level means essentially that the relative effectiveness of the method does not differ among the IQ levels.

Gains in spelling ability were in every case higher for the NISST than for the HASTT, since pre-test scores were higher on the easier test (HASTT) and the test ceiling easier to achieve. The order of effectiveness for Grade 2 on the more difficult test (NISST) was similar to the general findings reported previously on analysis of the main criterion measures in that the greatest gains were made on

Table 15

NUMBER AND MEAN IQ OF PUPILS BY GRADE USED FOR PROPORTIONAL METHOD BY IQ LEVEL GAIN SCORE ANALYSIS

Grade 2

		Method 1 T-S-T		Method 2 WPWT		Method 3 WPWOT		Method 4 C & P		Method 5 WB	
		N	M	N	M	N	M	N	M	N	M
Level 1	Total	14	94.86	17	93.82	27	91.96	14	94.64	30	95.40
(Below Q_1)	Proportional	14	94.86	14	94.93	14	92.79	14	94.64	14	94.50
Level 2	Total	64	111.53	58	109.69	67	109.06	60	109.73	51	110.47
(Q_1 to Q_3)	Proportional	51	110.04	51	109.75	51	108.94	51	109.88	51	110.47
Level 3	Total	25	126.28	23	122.39	33	110.42	29	123.83	21	123.14
(Above Q_3)	Proportional	21	126.48	21	122.52	21	124.00	21	124.00	21	123.14

Grade 3

		Method 1 T-S-T		Method 2 WPWT		Method 3 WPWOT		Method 4 C & P		Method 5 WB	
		N	M	N	M	N	M	N	M	N	M
Level 1	Total	34	96.03	34	94.59	24	95.50	30	93.47	29	96.69
(Below Q_1)	Proportional	24	95.63	24	94.63	24	95.50	24	94.33	24	96.67
Level 2	Total	47	108.36	57	108.65	60	109.08	47	108.34	53	106.81
(Q_1 to Q_3)	Proportional	47	108.36	47	108.38	47	109.04	47	108.34	47	107.49
Level 3	Total	29	123.76	40	110.45	30	120.20	41	121.56	27	122.37
(Above Q_3)	Proportional	27	123.11	27	121.15	27	120.19	27	121.11	27	122.37

Table 16

ANALYSIS OF GRADE 2 NISST GAIN SCORES BY IQ LEVEL

Number and Mean of NISST Gain Scores for Grade 2

	Method 1 T-S-T	Method 2 WPWT	Method 3 WPWOT	Method 4 C & P	Method 5 WB
N	86	86	86	86	86
M	36.23	34.12	37.97	32.09	33.51

Summary Analysis of Variance of Grade 2 NISST Gain Scores by IQ Level

Sources	df	SS	MS	F
Method	4	1851.06	462.77	2.90*
IQ Level	2	571.04	285.52	1.79
Cells	14	3882.37		
Method X IQ Level	8	1460.27	182.53	1.14
Within-Subgroups	415	66312.52	159.79	
Total	429	74077.26		

$^*F_{.05} = 2.37$

Order of Effectiveness from High to Low

1.	Word Perception Without Test	37.97	NS
2.	Test-Study-Test	36.23	NS
3.	Word Perception With Test	34.12	NS
4.	Workbook	33.51	NS
5.	Correction and Proofreading	32.09	

Table 17

ANALYSIS OF GRADE 2 HASTT GAIN SCORES BY IQ LEVEL

Number and Mean of HASTT Gain Scores for Grade 2

	Method 1 T-S-T	Method 2 WPWT	Method 3 WPWOT	Method 4 C & P	Method 5 WB
N	86	86	86	86	86
M	23.05	21.61	22.77	23.72	19.06

Summary Analysis of Variance of Grade 2 HASTT Gain Scores by IQ Level

Sources	df	SS	MS	F
Method	4	1156.60	289.15	2.47*
IQ Level	2	2339.07	1169.53	9.99***
Cells	14	4118.80		
Method X IQ Level	8	623.14	77.89	.67
Within-Subgroups	415	48603.53	117.12	
Total	429	56841.14		

*** $F_{.005} = 4.62$

* $F_{.05} = 2.37$

Order of Effectiveness from High to Low

1.	Correction and Proofreading	23.72	
			NS
2.	Test-Study-Test	23.05	
			NS
3.	Word Perception Without Test	22.77	
			NS
4.	Word Perception With Test	21.61	
			**
5.	Workbook	19.06	

Table 18

ANALYSIS OF GRADE 3 NISST GAIN SCORES BY IQ LEVEL

Number and Mean of NISST Gain Scores for Grade 3

	Method 1 T-S-T	Method 2 WPWT	Method 3 WPWOT	Method 4 C & P	Method 5 WB
N	98	98	98	98	98
M	26.91	24.02	22.41	20.98	22.68

Summary Analysis of Variance of Grade 3 NISST Gain Scores by IQ Level

Sources	df	SS	MS	F
Method	4	1964.64	491.16	3.87***
IQ Level	2	240.95	120.48	.95
Cells	14	2933.03		
Method X IQ Level	8	727.44	90.93	.72
Within-Subgroups	475	60368.57	127.09	
Total	489	66234.63		

*** $F_{.005} = 3.72$

Order of Effectiveness from High to Low

1.	Test-Study-Test	26.91	*
2.	Word Perception With Test	24.02	NS
3.	Workbook	22.68	NS
4.	Word Perception Without Test	22.41	NS
5.	Correction and Proofreading	20.98	

Table 19

ANALYSIS OF GRADE 3 HASTT GAIN SCORES BY IQ LEVEL

Number and Mean of HASTT Gain Scores for Grade 3

	Method 1 T-S-T	Method 2 WPWT	Method 3 WPWOT	Method 4 C & P	Method 5 WB
N	98	98	98	98	98
M	16.56	14.33	15.91	15.26	12.83

Summary Analysis of Variance of Grade 3 HASTT Gain Scores by IQ Level

Sources	df	SS	MS	F
Method	4	833.18	208.29	2.50*
IQ Level	2	394.30	197.15	2.36
Cells	14	1645.70		
Method X IQ Level	8	418.22	52.28	.63
Within-Subgroups	475	39614.01	83.40	
Total	489	42905.41		

* $F_{.05} = 2.37$

Order of Effectiveness from High to Low

1.	Test-Study-Test	16.56	NS
2.	Word Perception Without Test	15.91	NS
3.	Correction and Proofreading	15.26	NS
4.	Word Perception With Test	14.33	NS
5.	Workbook	12.83	

the Word Perception Without Test method. Again, adjacent means were not significantly different. However, complementary data from Table 24 indicate the marked superiority of the most effective method (WPWOT) over Word Perception With Test, Workbook, and Correction and Proofreading methods. This is in comparison with the next highest method, Test-Study-Test, where the one combination with Correction and Proofreading was significant. However, these results were not obtained when a gains analysis was made on the tests of lesser difficulty (HASTT, Table 17) where Correction and Proofreading was found to be most effective, but non-significant differences were obtained when compared with the adjacent method (Test-Study-Test). The inconsistent results between the order of effectiveness of spelling method on NISST gain scores reported in Table 16 and HASTT in 17 are even more remarkable when viewed from the standpoint of the complete reversal where Correction and Proofreading is the lowest in terms of effectiveness of spelling method on the NISST and the superior method when considering gains made on the HASTT.

Marked variation in order of effectiveness among the five experimental methods in Grade 3 is easily noted from Tables 18 and 19 when compared with the previous analyses of final criterion measures. In this case, however, the Test-Study-Test method produced the greatest gains on both the HASTT and NISST with the order of effectiveness of the next best methods appearing in no particular order when compared across tests.

Classroom Analyses

A classroom analysis of post-experimental spelling ability was made using the mean NISST and HASTT scores for each classroom as the unit of sampling for analysis. This analysis was made in order to generalize the relative effectiveness of methods to other classrooms. The four classroom analyses involving two tests (NISST and HASTT) at the two grade levels under investigation are reported in Tables 20 through 23. These tables present the number and post-test means of classrooms by method followed by a summary analysis of variance of these means. Significance tests of the simple effects are presented in the lower portion of those tables where a significant F among methods was obtained. An F of 4.09 obtained from an analysis of post-NISST classroom means was significant at the .05 level of confidence at Grade 2. The significance tests of the simple effects showed that the Word Perception Without Test method was significantly superior at the .01 level of

Table 20
CLASSROOM ANALYSIS OF GRADE 2 POST-NISST

Number and Mean of Classrooms

	Method 1 T-S-T	Method 2 WPWT	Method 3 WPWOT	Method 4 C & P	Method 5 WB
N	5	5	5	5	5
M	50.73	45.62	52.61	41.86	51.41

Summary Analysis of Variance

Sources	df	SS	MS	F
Method	4	413.99	103.50	4.09*
Within	20	506.33	25.32	
Total	24	920.32		

$* F_{.05} = 2.87$

Significance Tests of Simple Effects

	Method 2 WPWT	Method 3 WPWOT	Method 4 C & P	Method 5 WB
Method 1 Test-Study-Test	+5.11**	-1.88**	+ 8.88**	- .68
Method 2 Word Perception With Test		-6.99**	+ 3.76**	-5.79**
Method 3 Word Perception Without Test			+10.76**	+1.20
Method 4 Correction and Proofreading				-9.55**

$**D_{01} = 1.8359$

$*D_{05} = 1.3947$

Table 21
CLASSROOM ANALYSIS OF GRADE 2 POST-HASTT

Number and Mean of Classrooms

	Method 1 T-S-T	Method 2 WPWT	Method 3 WPWOT	Method 4 C & P	Method 5 WB
N	5	5	5	5	5
M	52.05	49.15	51.16	48.44	51.50

Summary Analysis of Variance

Sources	df	SS	MS	F
Method	4	49.58	12.40	.71NS
Within	20	350.75	17.54	
Total	24	400.33		

Table 22

CLASSROOM ANALYSIS OF GRADE 3 POST-NISST

Number and Mean of Classrooms

	Method 1 T-S-T	Method 2 WPWT	Method 3 WPWOT	Method 4 C & P	Method 5 WB
N	5	5	5	5	5
M	45.21	53.11	44.57	46.07	49.42

Summary Analysis of Variance

Sources	df	SS	MS	F
Method	4	254.20	63.55	1.32NS
Within	20	960.55	48.03	
Total	24	1214.75		

Table 23

CLASSROOM ANALYSIS OF GRADE 3 POST-HASTT

Number and Mean of Classrooms

	Method 1 T-S-T	Method 2 WPWT	Method 3 WPWOT	Method 4 C & P	Method 5 WB
N	5	5	5	5	5
M	43.78	50.33	48.55	49.33	51.74

Summary Analysis of Variance

Sources	df	SS	MS	F
Method	4	182.64	45.66	3.58*
Within	20	254.71	12.74	
Total	24	437.35		

*$F_{.05}$ = 2.87

Significance Tests of Simple Effects

	Method 2 WPWT	Method 3 WPWOT	Method 4 C & P	Method 5 WB
Method 1 Test-Study-Test	-6.56**	-4.78**	-5.55**	-7.96**
Method 2 Word Perception With Test		+1.78**	+1.00*	-1.41**
Method 3 Word Perception Without Test			- .78	-3.18**
Method 4 Correction and Proofreading				-2.41**

**D_{01} = 1.3024

**D_{05} = .9894

confidence to all but the Workbook method. The Workbook method, as second in order of relative effectiveness in the five experimental treatments, was not significantly different from the first method (Test-Study-Test), but was superior to Word Perception With Test, and Correction and Proofreading methods, respectively. The finding of Word Perception Without Test experimental treatment superiority on the more difficult test at Grade 2 supports previous results reported in Tables 9 and 16. Thus, Table 9 presents a summary covariance analysis of post-NISST scores with pre-NISST scores, IQ and TQI controlled and Table 16 shows a gain scores analysis using post-NISST score minus pre-NISST score as the basic unit for analysis. The post-HASTT classroom means by method at Grade 2 are reported in Table 21. A nonsignificant F of .71 was obtained from the analysis, so that tests between individual pairs of means were not made. This finding was not supported by the previous findings of significant overall differences among experimental spelling methods using the HASTT criterion at Grade 2 as reported in Table 10. The analysis of HASTT gain scores at Grade 2 as reported in Table 17 also suggests that significant differences apply to the different experimental spelling methods. Table 22 presents the number and mean of classrooms under the various experimental methods and a summary analysis of variance of these means at Grade 3. The nonsignificant F of 1.32 may be contrasted to the significant overall findings among the various methods on post-NISST scores at Grade 2. Again, the significance of the simple effects was not tested since the overall F was not significant. However, the analysis of post-HASTT scores at Grade 3 as reported in Table 23 showed the significant overall effects at the .05 level of confidence (F = 3.58) and tests of the simple effects were made which showed the superiority of the Workbook method over all other methods. These results were in contradiction to the results obtained on the covariance analysis of Grade 3 HASTT scores with pre-HASTT score, TQI, and IQ controlled (Table 12) and the analysis of gain scores of post-HASTT minus pre-HASTT scores (Table 19) where the Workbook method was last in terms of order of effectiveness.

Summary of Tests of All Possible Differences Among Methods

It should be noted that the best estimates of the order of effectiveness of any two methods is best gained by a thorough inspection of the appropriate cell in Table 24. The table should be read row by column; with a + sign indicating superiority of the method on the left hand

Table 24

THE SIGNIFICANCE OF THE SIMPLE EFFECTS FROM ALL ANALYSES FOR GRADES 2 AND 3

	Test-Study-Test Method 1	Word Perception With Test Method 2	Word Perception Without Test Method 3	Correction and Proofreading Method 4	Workbook Method 5
Test-Study-Test Method 1		GRADE 2 MEANS NISST +3.535* HASTT +2.432* STET - .048 GRADE 2 GAINS NISST +2.116 HASTT +1.442 GRADE 3 MEANS NISST - .306 HASTT -1.859* STET - .714* GRADE 3 GAINS NISST +2.888 HASTT +2.235	GRADE 2 MEANS NISST -1.904 HASTT - .750 STET -1.027* GRADE 2 GAINS NISST -1.733 HASTT + .279 GRADE 3 MEANS NISST +2.581* HASTT -2.046* STET - .257 GRADE 3 GAINS NISST +4.500** HASTT + .653	GRADE 2 MEANS NISST +6.870* HASTT +1.702 STET - .476 GRADE 2 GAINS NISST +4.140* HASTT - .674 GRADE 3 MEANS NISST +2.939* HASTT -1.648 STET -1.438* GRADE 3 GAINS NISST +5.929** HASTT +1.306	GRADE 2 MEANS NISST + .522 HASTT +2.116* STET - .974* GRADE 2 GAINS NISST +2.721 HASTT +3.988* GRADE 3 MEANS NISST + .596 HASTT - .416 STET - .433 GRADE 3 GAINS NISST +4.225** HASTT +3.735**
Word Perception With Test Method 2	GRADE 2 MEANS NISST -3.535* HASTT -2.432* STET + .048 GRADE 2 GAINS NISST -2.116 HASTT -1.442 GRADE 3 MEANS NISST + .306 HASTT +1.859* STET + .714* GRADE 3 GAINS NISST -2.888 HASTT -2.235		GRADE 2 MEANS NISST -5.439* HASTT -3.182* STET - .979* GRADE 2 GAINS NISST -3.849* HASTT -1.163 GRADE 3 MEANS NISST +2.887* HASTT - .187 STET + .457 GRADE 3 GAINS NISST +1.612 HASTT -1.582	GRADE 2 MEANS NISST +3.335* HASTT - .730 STET - .428 GRADE 2 GAINS NISST +2.023 HASTT -2.116 GRADE 3 MEANS NISST +3.245* HASTT + .211 STET - .724* GRADE 3 GAINS NISST +3.041 HASTT - .929	GRADE 2 MEANS NISST -3.013 HASTT - .316 STET - .926* GRADE 2 GAINS NISST + .605 HASTT +2.547 GRADE 3 MEANS NISST + .702 HASTT +1.433 STET + .281 GRADE 3 GAINS NISST +1.337 HASTT +1.500
Word Perception Without Test Method 3	GRADE 2 MEANS NISST +1.904 HASTT + .750 STET +1.027* GRADE 2 GAINS NISST +1.733 HASTT - .279 GRADE 3 MEANS NISST -2.581* HASTT +2.046* STET + .257 GRADE 3 GAINS NISST -4.500** HASTT - .653	GRADE 2 MEANS NISST +5.439* HASTT +3.182* STET + .979* GRADE 2 GAINS NISST +3.849* HASTT +1.163 GRADE 3 MEANS NISST -2.887* HASTT + .187 STET - .457 GRADE 3 GAINS NISST -1.612 HASTT +1.582		GRADE 2 MEANS NISST +8.774* HASTT +2.452* STET + .551 GRADE 2 GAINS NISST +5.872** HASTT - .954 GRADE 3 MEANS NISST + .358 HASTT + .398 STET -1.181* GRADE 3 GAINS NISST +1.429 HASTT + .653	GRADE 2 MEANS NISST +2.426 HASTT +2.866* STET + .053 GRADE 2 GAINS NISST +4.454* HASTT +3.709* GRADE 3 MEANS NISST -2.185 HASTT +1.630 STET - .176 GRADE 3 GAINS NISST - .276 HASTT +3.082*
Correction and Proofreading Method 4	GRADE 2 MEANS NISST -6.870* HASTT -1.702 STET + .476 GRADE 2 GAINS NISST -4.140* HASTT + .674 GRADE 3 MEANS NISST -2.939* HASTT +1.648 STET +1.438* GRADE 3 GAINS NISST -5.929** HASTT -1.306	GRADE 2 MEANS NISST -3.335* HASTT + .730 STET + .428 GRADE 2 GAINS NISST -2.023 HASTT +2.116 GRADE 3 MEANS NISST -3.245* HASTT - .211 STET + .724* GRADE 3 GAINS NISST -3.041 HASTT + .929	GRADE 2 MEANS NISST -8.774* HASTT -2.452* STET - .551 GRADE 2 GAINS NISST -5.872** HASTT + .954 GRADE 3 MEANS NISST - .358 HASTT - .398 STET +1.181* GRADE 3 GAINS NISST -1.429 HASTT - .653		GRADE 2 MEANS NISST -6.348* HASTT + .414 STET - .498 GRADE 2 GAINS NISST -1.419 HASTT +4.663** GRADE 3 MEANS NISST -2.543* HASTT +1.232 STET +1.005* GRADE 3 GAINS NISST -1.704 HASTT +2.429
Workbook Method 5	GRADE 2 MEANS NISST - .522 HASTT -2.116* STET + .974* GRADE 2 GAINS NISST -2.721 HASTT -3.988* GRADE 3 MEANS NISST - .596 HASTT + .416 STET + .433 GRADE 3 GAINS NISST -4.225** HASTT -3.735**	GRADE 2 MEANS NISST +3.013 HASTT + .316 STET + .926* GRADE 2 GAINS NISST - .605 HASTT -2.547 GRADE 3 MEANS NISST - .702 HASTT -1.433 STET - .281 GRADE 3 GAINS NISST -1.337 HASTT -1.500	GRADE 2 MEANS NISST -2.426 HASTT -2.866* STET - .053 GRADE 2 GAINS NISST -4.454* HASTT -3.709* GRADE 3 MEANS NISST +2.185 HASTT -1.630 STET + .176 GRADE 3 GAINS NISST + .276 HASTT -3.082*	GRADE 2 MEANS NISST +6.348* HASTT - .414 STET + .498 GRADE 2 GAINS NISST +1.419 HASTT -4.663** GRADE 3 MEANS NISST +2.543* HASTT -1.232 STET -1.005* GRADE 3 GAINS NISST +1.704 HASTT -2.429	

**.01 level of confidence
*.05 level of confidence

margin (row) and a - sign the superiority of the method on the column head. Some notion can be gained of not only the direction of differences between pairs of methods with respect to the three main criterion variables, but also with respect to gain scores. In some cases, results within the cells are inconsistent and probably due to the difficulty level or nature of the particular criterion measure used. In most cases, the gain scores analysis for a particular test at a particular grade level is consistent with that obtained for the analysis of covariance of the criterion measure on the same test where the gains analysis was made.

Conclusions and implications regarding the generalization of these data are somewhat questionable. The restriction of time under one experimental method would be influenced by marked differences in the nature of learning spelling at Grades 2 and 3. Substantially different and more consistent results might have been obtained had a longitudinal study across two academic years been made instead of the two cross-sectional studies. However, the longitudinal build-up of method effectiveness at Grade 2 would have been confounded at Grade 3 with an uncontrolled teacher effect and would have presented some almost impossible statistical design problems.

Supervisor's Report on Teachers' Reactions to Methods

It was felt to be extremely important to obtain the reaction of teachers to the method they used in the research project and the reaction they observed in their pupils as well. A communication was sent to the teachers April 22, 1963 in which they were asked to be specific in stating their reactions as well as that of their students. This communication was not in the form of a check list but it provided a space for the teachers to write narratives on their feelings toward the research method assigned to them.

A review of the most frequently mentioned items follow.

Method No. 1 (Test-Study-Test)

A number of teachers liked this method but with the reservation that they could enrich it with ideas of their own if they were to teach it again. They felt that adhering to this method as described in the study was too restrictive and mechanical and that it needed more variety and enrichment. Several teachers felt they could see little or no carry-over to other subject areas. Others said it was boring to the children. On the other hand, other teachers noted that it seemed to give some children a feeling of security to have their own textbook and know the general procedure of the lesson. Other teachers liked teaching it and said it was easy to teach but was not challenging enough for the fastest group. The most common complaint given was that this method lacked sufficient suggestions or "Helps" for the Tuesday and Thursday periods. They felt that the period was too long for the amount of work to be done.

Following are responses gained from questionaires submitted to teachers regarding their reaction to the method each used. There were ten teachers using each method.

		No. of Responses
1.	It gave children a feeling of security	1
2.	Teacher liked it	1
3.	Teachers liked it but not without enrichment	4
4.	It was easy to teach	1
5.	They liked the 5-step method of studying words	1
6.	There was carryover to other subject areas	1
7.	There was no carryover to other areas	3
8.	It was not enough of a challenge to top students	4
9.	There was not enough enrichment for Tuesday and Thursday assignments	7
10.	The method needed enrichment	7
11.	The textbook used alone is too restrictive	5
12.	It was boring to the children	3

In other words, there seemed to be little consistency in the comments of the various teachers. Those most consistent, however, were the criticisms that the textbook in itself was too restrictive, didn't challenge the superior student sufficiently and lacked enrichment exercises for Tuesday and Thursday study periods. Most of these teachers taught the Word Perception method the previous year which includes a number of spelling games and enrichment, and this may account for their attitude.

Method No. 2 (Word Perception With Test)

There were many more positive than negative comments about this method. With a few exceptions teachers generally liked this method and reported that the children enjoyed it also.

The fact that it gave experience in attacking new words and reinforced the use of many phonetic and structural analysis skills which are taught in reading were thought to be an advantage by the teachers who used this method. That there was opportunity for good participation for the slow as well as the fast student was another strong point for the method. Some teachers felt that it was more effective with the average and slow groups than with the fast groups. In general, they liked the weekly tests in that they gave them a periodic check on the needs of their group.

Some of the criticisms were that the word list was too easy for many of the children, but others thought that the substitution of blends, consonants, vowels, suffixes, and prefixes took care of that feature. Others thought the plan of instruction became tiresome and more variety could be used in that phase of the program. Some reported that the weak students disliked the test and that the superior ones were proud of their accomplishments and approved of the weekly tests. Some teachers felt they would like to group students in their classes according to good and poor spellers. They would give the strong students more words, and more difficult words and let the slow students travel at a decreased pace. They felt that the slow learners needed more practice on the difficult words than they got in the formal lesson. In conclusion, there seemed to be general agreement that this method strengthens the child's ability to use phonetic skills, that the teachers generally liked this method, and that they had few suggestions for improvement.

Following is a list of teachers' comments and the frequency with which they occurred.

		No. of Responses
1.	Gave power in attacking new words	4
2.	Helped weak speller	2
3.	Strengthened ability to use phonetic skills	8
4.	Children learned to spell more words than the list	6

	No. of Responses
5. Teacher liked weekly tests	3
6. Teacher thought method was effective in teaching children to spell	7
7. Emphasized same skills as reading	3
8. Method helped low and average group	5
9. Method helped superior and average group	1
10. Felt that the slow learners needed still more than method provided	2
11. Children learned to listen and pronounce words	3
12. Children liked method	4
13. Plan of instruction too tiresome	1
14. Would like to group in spelling	1
15. Didn't like substitution of medial vowel	2
16. Words too easy	2

Method No. 3 (Word Perception Without Test)

The teachers who used this method were in the same general agreement with the teachers in No. 2. They seemed to enjoy this method, with the exception that many of them would like to include a test, if not weekly, then more widely spaced than one week. But they all agreed that a check on the children's attainment is necessary. Only a few stated that it was a pleasure to teach without the pressure of a Friday test. One teacher said her children found it a joy just to see how many words they could learn each week and were relieved to know that no test loomed ahead. Others mentioned that the pupils liked to write their spelling on the board since they had a captive audience and took pride in writing their best. Still another disagreed with the majority and felt that the slow learners benefitted the least from this method but did conclude that she observed progress toward the end of the year.

This group felt also that more variety was needed to add interest to the program. Other comments indicated that the manual was a great help, that this method created an awareness in children of the composition of a word, and that it taught the child to listen and think more keenly.

In summary it is interesting to note that the comments were not all in agreement, but those most frequently mentioned were that the pupils were enthusiastic about the method,that this approach to teaching spelling reinforced reading skills, and that the teachers, themselves, liked to teach it.

Comments made by the teacher and the frequency with which they were made.

	No. of Responses
1. Children were enthusiastic about the method	8
2. Teachers liked it	7
3. Reinforced reading skills	7
4. Carryover to other subjects noticed	3
5. Teacher wanted a test	5
6. Liked having no test	3
7. Phonics skills were strengthened	4
8. Children liked spelling games	3
9. Children have a chance to see word relationships	3
10. Poor spellers benefitted least	2
11. Slow children showed progress at end of year	1
12. Children learn to listen and think	1
13. Method needs more variety	1
14. More boredom noticed in pupils	1

Method No. 4 (Correction and Proofreading)

In general, teachers reported that they found this method quite satisfactory for the average and superior groups. This method created for these children a great interest in spelling words correctly in their compositions. Rather than depending purely upon their phonetic rules, they learned to rely a great deal on the dictionary for help, especially in spelling words beyond their grade level. There seemed to be high interest in spelling and high standards for personal achievement in their school work. The students from the lower reading groups did not appear to benefit so much, particularly at the beginning of the year, as the other two groups. These students manifested rather weak interest, seemed to have low personal standards in regard to the quality of work they produced, and were observed to respond much less frequently in proofreading periods. Their compositions tended to contain an easier word level than the better students.

Some teachers felt the period was a little too long, and that there needed to be more variation in motivation and procedure.

One of the most frequent criticisms was the lack of opportunity for the teacher to thoroughly evaluate children's progress. They seemed to feel that a test once in awhile would be a guide line to the teachers.

In general teachers commented that this was an interesting method which seemed more realistic in approach than many methods. They said it raised the level of children's compositions and helped them learn the language arts skills more thoroughly.

"Skills, objectives, comments, and suggestions must be wisely guided by the teacher", observed one teacher. "This type of program needs careful supervision if it is to neither bore the gifted nor frustrate those with less ability." She continued to comment that this program had greater potential for either success or failure than a more clearly defined method, and that this necessitates the teacher's having a very clear understanding of the method.

In summary, the areas of highest agreement were that the teachers were much interested in this method for the reinforcement that it gave the other language arts skills; that they thought they noticed a considerable transfer of spelling skill to other areas and that the children's interest generally remained high.

Comments and their frequency among those who responded:

		No. of Responses
1.	Children's interest was high	6
2.	Teachers were much interested in the method	6
3.	Transfer of training noticeable	6
4.	Children became very alert to errors	3
5.	Did not limit superior student	3
6.	Superior students benefitted more than slow ones	5
7.	More variety needed	4
8.	Need some kind of test or check	2
9.	Good for language arts but not thorough enough in the spelling area	1
10.	Need for specific weekly period to study words missed most frequently	2
11.	Goal should be more clearly defined	1
12.	Children might be at a disadvantage in the testing in the research project because there were no experiences of test taking	1
13.	Method can become routine unless there was a good motivation	3
14.	Written procedure and a word list would have helped the teacher	2

Method No. 5 (Workbook)

A number of teachers stated that they enjoyed teaching with the use of a workbook but would not like it as the only means of teaching spelling. They generally felt that it needed more variety, that it stifled creativity on the part of both the teacher and the pupil, and that it lacked provision for the superior pupils. If the pupils wrote a perfect paper on Monday, there seemed to be a lack of provision for interesting work for him to do the remainder of the week. The slow groups seemed to benefit most from this method, but the format of the test pages confused them and consumed valuable time. Children in general seemed to like to have a workbook to use, and some liked filling in blanks and maintaining charts. Some teachers commented that not enough attention was given to phonetic and structural analysis, and that there didn't seem to be a noticeable carryover in other written work. A few teachers liked it because there was little preparation time needed for the teacher. Others thought it was too mechanical and called it a "dead, mechanical way of learning to spell".

Ninety per cent of the teachers agreed that the Workbook method lacked provision for the superior student, but otherwise there was not agreement among those who used the method.

Following are negative and positive comments and the number of teachers who made them on their questionnaire.

		No. of Responses
1.	Teachers enjoyed the method but not as the only means of teaching spelling	5
2.	Children enjoyed the use of the workbook	2
3.	Children were interested in maintained charts	4
4.	Children lacked the security of the method	2
5.	Preparation time for teachers was small	1
6.	The book gives systematic repetition of phonetic skills	2
7.	Teachers liked the five-step method of studying a word	2
8.	Method was too restrictive	5
9.	Not enough attention given to phonetic analysis	5
10.	More variety needed	4
11.	More enrichment needed	4
12.	Lacked provision for the superior student	9
13.	Slower pupils enjoyed it more than fast	4
14.	Pupils were bored with it	4
15.	Tuesday and Thursday "Helps" were not sufficient	6

SUMMARY OF RESULTS AND CONCLUSIONS

There is nothing in the results which suggests a clear-cut superiority of one method over all of the others. The results differed somewhat for the two grades, for the different criterion tests employed, and from one type of analysis to another.

These results serve to illustrate the advantage of relatively large-scale research projects. If this study had been conducted in "pieces" by many different investigators at different times, in different parts of the country, investigating the relative effectiveness of one method against one other, each at a single grade level, several definite statistically significant conclusions would have been reached. But the practical research consumer would have been faced with an almost impossible task of putting all of the information together into a pattern, because of the lack of comparability of methods execution, samples employed, criterion measures and controls employed, and methods of analysis.

Overall, Method 1 (Test-Study-Test) and Method 3 (Word Perception Without Test) appear to have some advantage over the others, particularly in Grade 2. Method 4 (Correction and Proofreading) and Method 5 (Workbook) generally yielded poorer results than the other three. Table 25 below indicates how many of the five comparisons of each method against every other method reported in Table 24 are significant at the five percent level. It should be remembered, however, that these comparisons are not independent. Two of the five comparisons are different types of analysis of the same criterion data for the Horn-Ashbaugh-Horn Spelling Textbook Test (HASTT), and two are analyses of the New Iowa Spelling Scale Test (NISST). The plus signs indicate a superiority of the method at the left, and the minus signs indicate superiority of the method listed at the top of the column.

Table 25

SUMMARY OF STATISTICALLY SIGNIFICANT COMPARISONS

	Grade 2 Method					Grade 3 Method				
	1	2	3	4	5	1	2	3	4	5
Method 1 (T-S-T) versus		++	-	++	++ -		--	++ -	++ -	++
Method 2 (WPWT) versus	--		----	+	-	++		+	+ -	
Method 3 (WPWOT) versus	+	++++		+++	+++	+ --	-		-	+
Method 4 (C & P) versus	--	-	---		+ -	+ --	+ -	+		+ -
Method 5 (WB) versus	+ --	+	---	+ -		--		-	+ -	

The HASTT was devised to measure the ability to spell the words specifically taught. Methods 1 (T-S-T) and 5 (WB) were designed to teach these words, but little emphasis was placed upon generalizing spelling ability to other words not included in the word list. The word lists were also taught directly in the Word Perception Methods (2 and 3), but these methods definitely emphasized the application of generalized spelling skills. The NISST was designed to measure the ability to spell words which were not specifically taught under any method. Method 4 (Proofreading and Correction) did not teach the word list at all and was concerned only with teaching words encountered in original compositions, both by direct and generalized methods. Method 4 came closest to what has been termed the "incidental" approach, although the spelling of specific words was accomplished for the most part by direct methods. The Sensitivity to Error Test was developed to determine which words (both those from the word list and those which had not been taught directly) pupils could identify as being correctly or incorrectly spelled in context. One might hypothesize that the relative superiority of methods might be as follows, other things being equal.

Criterion	Best	Average	Poorest
HASTT	Method 1 (T-S-T) Method 5 (WB)	Method 2 (WPWT) Method 3 (WPWOT)	Method 5 (P & C)
NISST	Method 2 (WPWT) Method 3 (WPWOT) Method 4 (P & C)		Method 1 (T-S-T) Method 5 (WB)
STET	Method 4 (P & C)	Method 2 (WPWT) Method 3 (WPWOT)	Method 1 (T-S-T) Method 5 (WB)

The results of the various analysis are summarized below with only the statistically significant differences indicated ($p = < .05$). There appears to be very little support of these hypotheses. Method 1 appears to fare reasonably well on HASTT comparisons but shows up even better on NISST comparisons. Method 5 does not show up at all well on HASTT comparisons. Methods 2 and 3 compare about as well on the HASTT as on NISST. Method 4 did not compare at all well on NISST. The results for the analysis of STET are quite inconclusive.

	Grade 2 Method					Grade 3 Method				
	1	2	3	4	5	1	2	3	4	5
					HASTT					
Method 1 (T-S-T)		+			+		-	-		
Method 2 (WPWT)	-		-			+				
Method 3 (WPWOT)		+		+	+	+				
Method 4 (C & P)			-							
Method 5 (WB)	-		-							
					NISST					
Method 1 (T-S-T)		+		+				+	+	
Method 2 (WPWT)	-		-	+				+	+	
Method 3 (WPWOT)		+		+		-	-			
Method 4 (C & P)	-	-	-		-	-	-			-
Method 5 (WB)				+					+	
					STET					
Method 1 (T-S-T)			-		-		-		-	
Method 2 (WPWT)			-		-	+			-	
Method 3 (WPWOT)	+	+							-	
Method 4 (C & P)						+	+	+		+
Method 5 (WB)	+	+							-	
					HASTT Gains					
Method 1 (T-S-T)					+					+
Method 2 (WPWT)										
Method 3 (WPWOT)					+					+
Method 4 (C & P)					+					
Method 5 (WB)	-		-	-		-		-		
					NISST Gains					
Method 1 (T-S-T)				+				+	+	+
Method 2 (WPWT)			-							
Method 3 (WPWOT)		+		+	+	-				
Method 4 (C & P)	-		-			-				
Method 5 (WB)			-			-				

In the analysis of gains, none of the methods-by-IQ levels interactions were significant. Thus, there was no conclusive evidence that the relative effectiveness of the methods differed from one IQ level to another. However, the fact that many of the post-experiment test scores were at or near the maximum possible may have been responsible for failure to obtain significant interactions.

The fact that two methods as different as the Test-Study-Test and the Word Perception Without Test proved to be so nearly equally effective under conditions of supervised, enlightened teaching in nearly optimum situations suggests that effectiveness of spelling instruction is not so much a matter of method but rather of how adequately the method is implemented. The fact that none of the methods was consistently superior to the others suggests that teachers be encouraged to develop a method which they feel they can employ most adequately. From the comments of the participants about the difficulties of avoiding "contamination" of one method with others, it is quite likely that in most instances this would involve a combination of methods.

Appendix A

Excerpts from Cedar Rapids second and third grade spelling program (manual to teachers)

DEVELOPMENT OF SPELLING POWER THROUGH THE UTILIZATION OF WORD PERCEPTION SKILLS AS TAUGHT IN READING (p.6-8)(10-11)

In addition to the emphasis on composition work, teachers have been encouraged to utilize word perception skills taught in reading to help children grow in spelling power. This has been done through the technique of substitution of initial consonants and blends (hand, black, street), substitution of vowels within words (cat, cot, cut), substitution of final consonants (cab, cat, can) and the addition of inflectional endings (paint, paints, painted, painting), forming of plurals (flags, boxes), No. 3, No. 5, No. 8. The extent to which such word perception skills are used in helping children spell new words is determined by those which are taught in reading at any given level.

THE SPELLING PROGRAM FOR GRADES TWO AND THREE

Because of the increased spelling achievement in classrooms where instruction has provided for (1) the reteaching of misspelled words in composition work and (2) the utilization of word perception skills taught in reading, the spelling program for Second and Third Grades is developed from this dual approach. The material in this bulletin has been prepared to show teachers how to improve spelling achievement (1) by the use of words misspelled in compositions and (2) by application of phonetic and structural analysis skills taught in reading to strengthen the spelling of isolated words in a provided list (from the lessons in the spelling text, SPELLING WE USE, Grades Two and Three). The following sections are devoted to this purpose.

GRADE THREE

Lesson 1
page 7

along
letters
does
ever
writing
send
try
sure
few
bird
now
than
fun
call
found

Review: off, school, name, town, away

1. along

Determine the number of syllables: Provide auditory training by having the children tap (lightly) out the number of syllables. (a-long) Include similar words, as: a-lone, a-loud.

2. letters

Determine the number of syllables. (let-ters) Determine the root word. (letter)

Identify the beginning. Substitute initial consonants, to write: better, wetter.

Say: "Take away the beginning of 'letter' and substitute a 'b'. What do you have?" (better) Continue in this way, with 'w' and 'wetter'.

Vary this procedure, by saying: "Write the word 'letter'. Change it to 'better'. What consonant did you change?"

3. does

This is a sight word and must be taught as such. Identify the beginning letter. (d)

4. ever

Determine the number of syllables. (ev-er) Include: ev-er-y, nev-er.

Say: "Write the word 'ever'. Now add an 'n' at the beginning. What do you have?....Now write 'ever' again. Add a 'y' at the end. What word do you have?"

Vary: Write 'ever'. Change it to 'never'. What letter did you add?....Write 'ever' again. Change it to 'every'. What did you add?

Lesson 1, Cont.

5. writing

Determine the number of syllables. (writ-ing) Identify the root word. (write)

Show how final 'e' in the root form is dropped before the ending is added. Include similar words: bake-baking; hid-hiding.

6. send

Identify the beginning. (s) Say: "Take away the beginning of 'send' and substitute another consonant. What word can you write? (lend, mend, bend). "Take away the beginning of 'send' and add the two-letter beginning, 'sp'. What word do you have?" (spend)

Vary this procedure, by having the word written first, and the consonant which was substituted, identified last.

Identify the medial vowel. (e) Substitute 'a', to write 'sand'.

Add the inflectional endings to write 'sends' and 'sending'.

7. try

Identify the beginning. (tr) Say: "Take away the 'tr' in 'try'. Substitute a 'b' and write (by). Substitute an 'm' and your word is (my)." Continue, in this way, substituting two-letter beginnings, to write: cry, dry, fly, fry, sky.

Vary this procedure, by having the word written first, and beginnings identified after each.

Show how final 'y' is changed to 'i' and the inflectional endings added to write: tries, tried. . . Final 'ing' is added to the root form to write: trying.

8. sure

This is a sight word and must be taught as such.

Lesson 1, Cont.

9. few

Identify the beginning. (f) Say: "Take away the 'f' in 'few'. Substitute another consonant. What words can you write? (new, dew) Continue, in this way, substituting two-letter beginnings, to write: chew, drew, flew, grew, stew.

Vary this procedure, by having the word written first, and the beginnings identified after each one.

Show how endings can be added to the word to write: fewer, fewest.

10. bird

Ending: birds

11. now

Identify the beginning consonant. Substitute other initial consonants, to write: cow, how.

Vary this procedure, by having the word written first, and then identifying the consonant beginning.

12. than

Identify the beginning.

Say: "Write the word 'than'. Take away the beginning and substitute letter 'f'. What do you have?" Continue, in this way for: man, pan, ran, tan. Reverse the procedure, by writing the word first, and then naming the initial consonant used.

Identify the medial vowel. Substitute 'e'. What is the word? Write 'then'. What vowel is used?

13. fun

Identify the beginning consonant.

Substitute other single consonant beginnings to write: bun, gun, run, sun.

Identify the vowel. Substitute other vowels to write: fin, fan.

14. call

Identify the beginning.

Say: "Let's see how many words we can write. Take away the beginning of 'call'. What word would you have if you added a 'b'? An 'f'? An 'h'? A 't'? A 'w'? . . . Take away the beginning. What word would you have if you added 'st'?"

Reverse the procedure, writing the whole word, then identifying the beginning.

Show how inflectional endings can be added to write: calls, called, calling.

15. found

Identify the beginning.

Say: "If you can spell 'found', what other words can you spell?" Elicit: pound, sound, round, ground.

Caution: Pronunciation

Strive for a natural, unaffected pronunciation. Words pronounced in isolation are often distorted. For example, try the following:

Pronounce: along
Read: The boy walked along the road.

Try to pronounce words in isolation exactly as they would be pronounced in actual conversation, without artificially stressing any part.

When helping children to hear the syllables in a word, it is helpful to have them tap their fingers lightly on the desks as they listen to the word. In this kind of activity, do not stress the words unduly, but try to pronounce them naturally. Ask the children to pronounce the words as they tap their fingers against the palm of a hand.

Appendix B

TEACHER RATING SHEET

P.L. 531 Cooperative Research Project No. 1869
Cedar Rapids Public Schools and State University of Iowa

You are already well-informed about the characteristics of this research study. One of the provisions in the contract with the U.S. Office of Education is that evidence be secured that teachers using the five methods are judged to be equally competent.

Three independent ratings are to be secured for each teacher, one from each of the building principals and two from the central administrative staff. These are to be "blind" ratings, i.e., none of the raters will ever know how the others rated any of the teachers. An envelope is provided with these blanks to mail them directly to Dr. Hieronymus. He will analyze the ratings to obtain an over-all index and destroy the blanks. He will be the only person ever to see the blanks or the indices.

School____________________________

Teacher's Name____________________

Rater's Name______________________

It is recognized that the people rating the teachers will have varying degrees of knowledge about the teacher. In some cases the rater will have had almost no contact with the teacher. Please check below the degree to which you know the teacher and are familiar with her work.

_____Have known the teacher for a long time; have had many opportunities to observe her work.
_____Reasonably well acquainted with her work.
_____Have had limited opportunity to observe her work.
_____New teacher; very little first-hand knowledge.

The teacher rating called for is necessarily a highly subjective one. It calls for judgement of the teacher's over-all effectiveness in teaching the language arts. It includes all aspects of teaching: knowledge of subject matter, ability to motivate pupils, pupil control, etc.

Please rate this teacher in relation to all elementary teachers you have ever known.

_____Very superior; in upper 5%
_____Superior; in upper 10% but not in upper 5%
_____Excellent; in upper 25% but not in upper 10%
_____Very good; in upper 50% but not in upper 25%
_____Fair; in lower half but not in bottom quarter
_____Poor; in bottom quarter

Comment:____

____

____

____

Appendix C

CEDAR RAPIDS COMMUNITY SCHOOLS
Cedar Rapids, Iowa

September 25, 1962

TO: Elementary School Principals
FROM: Hale C. Reid
Re: Spelling Research Pre-Test Instructions

The spelling pre-tests for grades two and three will be administered during the period of September 26 through October 5, 1962. Tests are to be administered by the principals. Absentees may be picked up any time during the month of October and these tests may be administered by the teachers.

The second grade pupils involved in this research will be given six pre-tests of twenty words each. The third grade children will be given four tests of thirty words each. Standard manuscript paper for each grade should be used by the pupils. Use only one side of the paper for each test and identify the paper as "Test No. 1, Second Grade", along with the pupil's name and school followed with an "X" which should be in the upper right hand corner of the paper. For the second grade tests, have children fold the manuscript paper from left to right. This will put a vertical crease in the center of the paper. This will serve as a guide line for two columns of words of ten each. The third grade should fold their paper likewise with two creases which will give them three columns on which they will write ten words each.

Teachers should remain in the room while the principal is administering the test because some children may need guidance on the folding and writing within the columns. It is advisable that each child write numbers down the left-hand side of the columns before starting the test. To facilitate scoring, the papers will have to be uniform and the teachers can assist in seeing that the children follow directions explicitly. It will not be necessary to report absentees because these will show up in the records of the research office as the papers are scored. Wrap, clip, or tie each set of papers separately. There should be an identification of the teacher's name and school somewhere on the package. These may be sent to the research office separately after they have been administered.

Principals will follow the order of administration attached to this communication. It might be advisable to vary the time of day from test to test so that no one group always has the spelling test the first thing in the morning. Do not deviate from the order included.

Pronounce each word in the list then follow with the sentence listed opposite the word on the copy of the test. In some cases it may be necessary to repeat the descriptive sentence. Space the pronunciation of the words according to the speed at which the group writes. There is no time limit on these tests, however, it is anticipated that it should be possible to cover at least one word per minute. If the child does not know how to spell the word, he should leave a blank space. Please have the supervising teacher watch for these omissions so that the child maintains the proper numerical sequence. It is not necessary that the regular room teacher be present during the test period, a substitute teacher can help in this case.

CEDAR RAPIDS COMMUNITY SCHOOL DISTRICT
Cedar Rapids, Iowa

Communication

May 14, 1963

TO: Teachers in Spelling Project

FROM: Hale C. Reid, Director of Elementary Education

Accompanying this communication are copies of Post-test #3 for second and third grades. This is a test on sensitivity to error and the second grade test is entitled "Sammy Squirrel Helps His Mother", and the third grade test is entitled "Learning to Skate."

Each child in the spelling project should be given the opportunity to draw a circle around misspelled words occuring in the composition. There are fifteen misspelled words in each composition. The following words are misspelled in the second grade composition:

1. tried
2. ben
3. stor
4. Im
5. lost
6. geting
7. Sumer
8. comeing
9. wated
10. Ther
11. filed
12. aslepe
13. insied
14. Wat
15. alon

The following words are misspelled in the third grade composition:

1. luckey
2. runing
3. Unkle
4. becaus
5. Winner
6. moring
7. Wate
8. cryed
9. sudenly
10. icey
11. reterned
12. thoght
13. eazy
14. togather
15. abel

If you correct the composition please enter the total number of corrections that the child made in the upper right-hand corner of the composition. The child's full name, method and teacher's name should be entered either by the pupil or by the teacher.

Do not use over twenty minutes total time for the administration of this test. Make-ups can be administered up to and including May 24.

Appendix D

Second Grade
Spelling Test NISST I

1.	friend	My friend is sick.	friend
2.	their	The boys lost their ball.	their
3.	children	The children have gone home.	children
4.	every	I go to school every day.	every
5.	second	We are in second grade.	second
6.	would	I wish they would come.	would
7.	story	The story was good.	story
8.	kind	He is a kind man.	kind
9.	nice	She is a nice girl.	nice
10.	dress	Her dress is pretty.	dress
11.	thank	Thank you for the gift.	thank
12.	about	The story is about a dog.	about
13.	coming	My sister is coming home.	coming
14.	jump	My dog can jump through the hoop.	jump
15.	dinner	We have eaten dinner.	dinner
16.	next	I will go next time.	next
17.	dear	She is a dear baby.	dear
18.	ice	The ice is cold.	ice
19.	show	We went to the show.	show
20.	read	The teacher will read to us.	read

Appendix D, Cont'd.

Second Grade
Spelling Test NISST II

1.	brought	She brought me a new dress.	brought
2.	merry	We heard the merry sound of laughter.	merry
3.	birthday	Tomorrow is my birthday.	birthday
4.	once	I once had a pet rabbit.	once
5.	summer	The summer weather is hot.	summer
6.	again	Come again when you can.	again
7.	water	The water is cold.	water
8.	fish	I caught a fish.	fish
9.	party	We are having a party.	party
10.	grade	I am in second grade.	grade
11.	thing	Pie is one thing I like.	thing
12.	before	We have been here before.	before
13.	goes	I hope she goes with me.	goes
14.	think	I think I can go with you.	think
15.	just	We just heard the news.	just
16.	where	He knows where I live.	where
17.	don't	We don't have any pets.	don't
18.	made	My mother made me a new dress.	made
19.	feed	We are going to feed the dog.	feed
20.	said	He said I could go with you.	said

Second Grade
Spelling Test NISST III

1.	because	We stopped because we were tired.	because
2.	please	May we please come again?	please
3.	could	We could go together.	could
4.	pretty	The dress is pretty.	pretty
5.	train	The train is long.	train
6.	always	We always go to school.	always
7.	wish	I wish she could go with me.	wish
8.	morning	Tomorrow morning we will go to school.	morning
9.	night	It rained last night.	night
10.	snow	The snow is deep.	snow
11.	year	Next year I will be in third grade.	year
12.	bring	She is going to bring me a present.	bring
13.	letter	I am going to write a letter.	letter
14.	best	She had the best grade.	best
15.	much	I don't have much to do.	much
16.	any	We haven't any time.	any
17.	coat	My coat is new.	coat
18.	other	The other children are gone.	other
19.	more	I would like some more cake.	more
20.	and	We work and play.	and

Second Grade
Spelling Test HASTT IV

1.	sacks	The sacks are full.	sacks
2.	helped	I helped my mother last night.	helped
3.	oven	The oven is hot.	oven
4.	ill	Some of the children are ill.	ill
5.	many	We have many words to spell.	many
6.	know	We know how to spell.	know
7.	hit	I can hit the ball.	hit
8.	daddy	My daddy is tall.	daddy
9.	eggs	The eggs are broken.	eggs
10.	fly	Airplanes fly above the clouds.	fly
11.	good-bye	They said good-bye to us.	good-bye
12.	now	Now we are going to count.	now
13.	make	I am going to make a dress.	make
14.	cannot	He cannot catch the ball.	cannot
15.	past	We went past the corner.	past
16.	went	They went to school yesterday.	went
17.	home	We will go home tomorrow.	home
18.	eat	They are going to eat dinner.	eat
19.	to-day	She will come home to-day.	to-day
20.	three	My brother is three years old.	three

Second Grade
Spelling Test HASTT V

1.	words	This page is filled with words.	words
2.	rabbits	The rabbits are white.	rabbits
3.	add	We will learn to add this year.	add
4.	jacks	They are playing with jacks.	jacks
5.	pick	We are going to pick the flowers.	pick
6.	rage	Red ties are all the rage this season.	rage
7.	sad	He was sad because he lost his money.	sad
8.	joy	He jumped for joy when he saw the parade.	joy
9.	ride	We will ride the pony.	ride
10.	being	The dog is being fed.	being
11.	land	The land is dry.	land
12.	school	I like to go to school.	school
13.	zoo	We went to the zoo.	zoo
14.	find	Please find my hat for me.	find
15.	income	His store has a large income.	income
16.	doll	The doll has many dresses.	doll
17.	toys	She broke her toys.	toys
18.	get	Get me a knife.	get
19.	fun	We have fun at school.	fun
20.	baby	She is a pretty baby.	baby

Appendix D, Cont'd.

Second Grade
Spelling Test HASTT VI

1.	became	He became ill last night.	became
2.	eight	She is eight years old.	eight
3.	called	He called me yesterday.	called
4.	take	He is going to take my picture.	take
5.	very	The sun is very hot.	very
6.	walk	The children went for a walk.	walk
7.	sand	There is sand on the beach.	sand
8.	tall	He is a tall man.	tall
9.	apple	I like apple pie.	apple
10.	that	I like that better.	that
11.	house	Our house is white.	house
12.	band	The band marched down the street.	band
13.	room	This room is large.	room
14.	going	We are going on a trip.	going
15.	milk	I drink milk every day.	milk
16.	ago	We saw her two years ago.	ago
17.	us	The teacher reads to us.	us
18.	saw	He will saw the board in two.	saw
19.	runs	That boy runs fast.	runs
20.	did	Did he go to school yesterday?	did

Third Grade
Spelling Test NISST I

1.	beautiful	He garden is beautiful.	beautiful
2.	since	We have been here since morning.	since
3.	weather	The weather is nice today.	weather
4.	clothes	Her clothes are always clean.	clothes
5.	picture	I have a picture of my mother.	picture
6.	merry	We heard the merry laughter of children.	merry
7.	until	They played until they were tired.	until
8.	heard	I never heard him sing.	heard
9.	vacation	Our vacation will start soon.	vacation
10.	their	They lost their book.	their
11.	getting	We are getting a new car.	getting
12.	thought	I thought the answer was right.	thought
13.	church	Our church is big.	church
14.	learn	We will learn to spell many words this year.	learn
15.	feeling	She is not feeling well today.	feeling
16.	didn't	He didn't go to the game.	didn't
17.	knew	She knew the right answer.	knew
18.	people	Many people visit the zoo.	people
19.	which	I saw which one you took.	which
20.	ready	Everyone was ready to go to school.	ready

21.	again	Come again when you can.	again
22.	dance	I am going to a dance tonight.	dance
23.	across	He ran across the yard.	across
24.	visit	I will visit you next week.	visit
25.	window	The boys broke the window.	window
26.	money	I found some money.	money
27.	kitten	My kitten is white.	kitten
28.	few	Only a few children are here.	few
29.	shall	We shall play the game now.	shall
30.	others	Some of the children are here; the others are ill.	others

Appendix D, Cont'd.

Third Grade
Spelling Test NISST II

1.	answer	She knew the answer.	answer
2.	board	He sawed the board in two.	board
3.	chickens	Let me feed the chickens.	chickens
4.	enjoy	We will enjoy the program.	enjoy
5.	lesson	She will take her music lesson today.	lesson
6.	should	We should finish our work.	should
7.	bought	We bought the gift today.	bought
8.	radio	My radio is broken.	radio
9.	pencil	I lost the pencil.	pencil
10.	wrote	He wrote a book.	wrote
11.	nearly	He is nearly nine years old.	nearly
12.	uncle	His uncle arrived yesterday.	uncle
13.	great	He was a great man.	great
14.	together	We always work together.	together
15.	already	He has already finished his dinner.	already
16.	early	We rose early this morning.	early
17.	meet	I will meet you at noon.	meet
18.	hundred	There are a hundred cents in a dollar.	hundred
19.	month	A month has four weeks.	month
20.	Tuesday	The day after Monday is Tuesday.	Tuesday

21.	basket	We put the basket into the car.	basket
22.	please	Will you please listen carefully?	please
23.	done	We are done with the work.	done
24.	wait	Let's wait in the shade.	wait
25.	loving	Some animals are so loving.	loving
26.	teacher	Our teacher is nice.	teacher
27.	pair	I have a new pair of glasses.	pair
28.	garden	The garden has many flowers.	garden
29.	might	I might be able to go.	might
30.	seat	There is a seat for each child.	seat

Third Grade
Spelling Test HASTT III

1.	problems	These problems are hard.	problems
2.	stair	The stair is broken.	stair
3.	quit	He quit his job.	quit
4.	wondering	He was wondering who I am.	wondering
5.	uses	A hunter uses a gun.	uses
6.	melt	Heat will melt the ice.	melt
7.	often	We see him often.	often
8.	after	I go home after school.	after
9.	badly	He hurt his arm badly.	badly
10.	kick	He can kick the football.	kick
11.	mild	He has a mild temper.	mild
12.	case	We bought a case of pop.	case
13.	hang	Mother makes me hang up my clothes.	hang
14.	oven	The oven is hot.	oven
15.	sixth	He is in the sixth grade.	sixth
16.	eight	She is going to be eight years old tomorrow.	eight
17.	ended	The story ended happily.	ended
18.	it's	It's raining today.	it's
19.	ill	He has been ill.	ill
20.	words	The words are hard.	words

21.	inch	Every inch of this floor is dirty.	inch
22.	recall	I don't recall his name.	recall
23.	joke	They played a joke on me.	joke
24.	head	He is the head of the company.	head
25.	rope	He tied the rope in knots.	rope
26.	thin	She is a thin girl.	thin
27.	missing	Some of the children are missing today.	missing
28.	note	She played the wrong note.	note
29.	pick	He will pick me up after school.	pick
30.	years	We have lived here two years.	years

Third Grade
Spelling Test HASTT IV

1.	younger	He has three younger brothers.	younger
2.	velvet	Her dress is velvet.	velvet
3.	rim	The rim of the cup is chipped.	rim
4.	flight	He fell down a flight of stairs.	flight
5.	grab	The baby can grab his toys.	grab
6.	sacks	He bought two sacks of candy.	sacks
7.	understanding	He is a very understanding person.	understanding
8.	large	That is a large house.	large
9.	grind	The butcher will grind the meat.	grind
10.	junk	Throw away this junk.	junk
11.	rabbits	These rabbits are very small.	rabbits
12.	does	She does her work well.	does
13.	indeed	It is indeed a good story.	indeed
14.	farmers	The farmers are busy this time of year.	farmers
15.	desk	This desk is new.	desk
16.	master	Learn to master your anger.	master

17.	half	We at a half pound of candy.	half
18.	cage	The lion is kept in a cage.	cage
19.	jacks	He jacks up the car to change a tire.	jacks
20.	afternoon	We have worked hard this afternoon.	afternoon
21.	banker	A banker is an important man.	banker
22.	goes	He goes to school.	goes
23.	key	She lost the key to the door.	key
24.	faster	He can run faster than I.	faster
25.	rage	Keep your temper; don't rage.	rage
26.	know	I know him very well.	know
27.	summer	Summer is my favorite season.	summer
28.	pond	The pond is deep.	pond
29.	inside	The inside of the building is new.	inside
30.	apple	This apple is ripe.	apple

Pupil____________________

Teacher__________________

School___________________

Method___________________

Grade____________________

SAMMY SQUIRREL HELPS HIS MOTHER
Grade 2 STET

Sammy Squirrel was tried. All day he had ben going up and down the big tree. He was helping Mother Squirrel stor nuts.

"Im tired," said Sammy Squirrel. We have lost of nuts. Can't we stop now?"

"It is geting cold," said Mother Squirrel. "Sumer has gone and cold days are comeing. You will be glad to eat the nuts when winter comes. Come, Sammy, you wated to help me. Ther are more nuts to put in the old tree."

Up and down the tree went Mother Squirrel. Up and down went Sammy.

"Now, not a nut is left," said Mother Squirrel. We have filed the big hole. You can stop, Sammy."

But Sammy did not hear his mother. He was fast aslepe insied the big tree.

"Wat a good little squirrel you are," smiled Mother Squirrel. I could not have filled the hole alon."

Pupil________________

Teacher______________

School_______________

Method_______________

Grade________________

LEARNING TO SKATE
Grade 3 STET

"This is my luckey day," said Joe, as he and Tommy were runing across the yard. Unkle Bill's present came just in time. He knows I have wanted ice skates for a long time."

"I'm glad it's Saturday, becaus there is no school," said Tommy. "Winner is the best time of the year. Let's skate all moring."

Soon the boys had their skates on and Tommy was flying across the pond.

"Wate for me, Tommy," called Joe. "I want to skate with you."

Tommy looked back. "Look out, Joe," he cryed. But it was too late! Joe's feet sudenly flew up, and down he sat on the icey pond.

"Are you hurt, Joe?" asked Tommy as he reterned to help him.

"I guess not, but that ice is hard," said Joe. I thoght I saw stars!"

Tommy pulled him up and soon Joe was ready to try again. "Put one foot in front of the other, Joe. Push with the other foot."

"It looks eazy," said Joe, "but my feet don't work togather."

"You're doing fine," said Tommy. "There you go!"

But down went Joe again! "I hope I will be abel to stand up on these skates," he laughed. "I didn't think it would be so hard to learn. Maybe this isn't a good day for me after all."